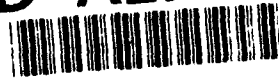


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September 1993

The Defense Commissary Agency

A Business Case for Electronic Data Interchange

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The Defense Commissary Agency: A Business Case for Electronic Data Interchange

Executive Summary

The Defense Commissary Agency (DeCA) – the product of a 1991 consolidation of Military Service commissary functions – prepares, receives, or issues more than 21 million business documents and transactions annually. Through the use of electronic data interchange (EDI) techniques, DeCA should be able to reduce the cost of processing those documents and transactions by more than \$57 million over the next 10 years for a modest \$2.5 million investment.

Building upon its recent successful EDI pilot test, we recommend that DeCA begin the transition to a fully electronic business environment by aggressively implementing EDI in the two areas that account for more than 90 percent of its direct cost savings – invoicing and payment. Subsequently, DeCA should expand its EDI efforts to include item pricing and maintenance, receiving and ordering, and contracting functions. We also recommend that DeCA implement several business process improvements, particularly the dissemination of point-of-sale data and delivery-ticket invoicing, that have the potential to significantly increase its EDI savings.

To aid in launching a comprehensive and effective EDI program, we further recommend that DeCA:

- ◆ Use both generic and grocery-specific EDI transaction sets
- ◆ Develop detailed operating concepts for all EDI applications
- ◆ Formulate interim and long-term technical solutions that satisfy the Department of Defense's (DoD's) requirements for a standard EDI architecture
- ◆ Prepare a multi-year implementation plan that focuses on establishing EDI relationships with its 700 largest manufacturers, which jointly account for an estimated 90 percent of all invoices.

The success of DeCA's EDI program depends upon two factors: its use of existing EDI standards and guidelines, and its ability to commit necessary resources to ensure a timely and effective implementation. Given that its invoicing and payment functions will be transferred to the Defense Finance and Accounting Service – Columbus Center (DFAS-CO), DeCA needs to use DFAS-CO approved transaction sets and implementation guidelines wherever possible. Further, DeCA's EDI trading partner base – nearly 2,100 trading

partners submit one or more invoices to DeCA each week – will not be brought under the program without a significant resource commitment. We estimate that implementing and managing DeCA's EDI program will require a minimum of four full-time, highly skilled personnel for the life of the program.

The DeCA creates and processes more than one-third of all DoD purchase orders. By implementing EDI, DeCA will take a large step toward achieving the DoD's goal of developing a paperless procurement process.

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DISPATCHED TO WORLD 5

| | |
|----------------------|-------------------------------------|
| Accession For | |
| NTIS GRA&I | <input checked="" type="checkbox"/> |
| DTIC TAB | <input type="checkbox"/> |
| Unannounced | <input type="checkbox"/> |
| Justification | |
| By | |
| Distribution/ | |
| Availability Code | |
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| A-1 | |

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CHAPTER 1

Introduction

PURPOSE

Two recent studies highlight the importance of the Defense Commissary Agency (DeCA) to the Department of Defense's (DoD's) electronic data interchange (EDI) program. The first, completed in 1990, indicated that more than 85 percent of EDI savings will come from two areas: finance and procurement.¹ The second study noted that DeCA is responsible for almost one-third of all DoD procurement actions.²

This report presents a business plan to guide DeCA in implementing its EDI program. It identifies the most promising opportunities for applying EDI, analyzes the life-cycle benefits and costs associated with those opportunities, and provides a preliminary work plan and schedule designed to help DeCA implement EDI in an orderly and cost-effective manner.

OVERVIEW OF EDI

Electronic data interchange is the computer-to-computer exchange of routine business information in a standard format. Ideally, EDI information should flow from one application system to another without human intervention. As a practical matter, however, most agencies do not achieve this objective until they combine EDI with other closely related business process and automation improvements.

Numerous private-sector firms are using EDI to replace paper purchase orders, shipping notices, receipts, invoices, payments, and a variety of other business documents. As a result, they are reaping a variety of benefits, including reduced errors in data entry, decreased paper handling, reduced inventories, improved cash management, and shortened order times.

Several data exchange techniques are frequently mislabeled as EDI. For example, facsimile (FAX) transmission of a paper document from one FAX machine to another is not EDI because it requires someone to interpret the written data and rekey it into an applications system. Although electronic mail (E-mail) eliminates the paper associated with FAX transmissions, it still is not

¹LMI Report DL001-06R1, *A Business Case for Electronic Commerce*, Hardcastle, Thomas P. and Thomas W. Heard, September 1990.

²LMI Report DL203R2, *Electronic Data Interchange Opportunities in Defense Procurement*, Drake, Daniel J., May 1992.

EDI because the information it moves is unstructured and, like FAX transmissions, requires interpretation and rekeying before it can be entered into an applications system for processing. Finally, document imaging is not EDI. Although imaging standards exist, this technology still depends on the existence of a paper document.

A key factor separating EDI from non-EDI applications is the use of standardized formats or transaction sets. Prior to 1979, various industry groups (transportation, grocery, warehousing, etc.) developed their own standards for transmitting EDI information. In 1979, the American National Standards Institute (ANSI) formed the Accredited Standards Committee (ASC) X12 to develop uniform standards for electronically exchanging business transactions across industry groups. Currently, ANSI has approved more than 90 such standards. In addition, the United Nations has developed an international message standard – EDIFACT, or EDI for Administration, Commerce, and Transport – that is based largely upon ASC X12 transaction sets.

EDI WITHIN THE DEPARTMENT OF DEFENSE

Although not new to the DoD, the use of EDI received a major boost in May 1988 when then Deputy Secretary of Defense Taft directed DoD Components to make "... maximum use of electronic data interchange for the paperless processing of all business-related transactions. ..." He also charged the Assistant Secretary of Defense (Production and Logistics), ASD(P&L), with responsibility for establishing guidelines for "... acceptance of EDI as the normal way of doing business with DoD by the early 1990's."

In response to that charge, the ASD(P&L) designated the Defense Logistics Agency as DoD's Executive Agent for EDI and Data Protection and directed that the Executive Agent provide the leadership required to implement EDI throughout the DoD. The Executive Agent began with the publication of a business case that projected more than \$1.2 billion in life-cycle savings from replacing just 16 key DoD documents with electronic transmissions. Shortly thereafter, the DoD issued Defense Management Report Decision (DMRD) 941, "Implementation of Electronic Data Interchange in DoD," which established a goal that 92 percent of Defense business transactions be conducted using EDI by FY97.

RELATED EFFORTS

One of the DoD's largest EDI-related projects is the Modernization of Defense Logistics Standard Systems (MODELS). For the past three decades, DoD logistics activities have used the Defense Logistics Standard Systems to communicate with each other. Unfortunately, those transactions are fixed length and not as flexible as variable-length EDI formats. By changing both the formats and supporting procedures, MODELS will fundamentally redesign the flow of supply, transportation, contract administration, and billing information throughout the

DoD. It will satisfy requirements for additional information, exploit new communications technologies, and provide a foundation for other EDI efforts throughout the DoD.

The DoD EDI program is an integral part of the Corporate Information Management (CIM) initiative, which focuses on restructuring the DoD's information processing environment by replacing Military Service-unique systems for payroll, logistics, and other support functions with standard applications. Besides EDI, CIM also includes the Computer-aided Acquisition and Logistics Support (CALS) program, which promotes the paperless exchange of technical information during the development and operation of weapon systems. In many applications, CALS exchanges complement the business transactions supported by EDI. Another initiative related to EDI is Business Process Reengineering (BPR). This initiative focuses on changing business processes to improve productivity and quality and to reduce costs. Each of these three initiatives has the potential to significantly enhance the amount of savings achieved through implementing EDI.

REPORT ORGANIZATION

Although the primary purpose of this report is to present a business case for EDI, we also provide DeCA with much of the detailed, practical information it needs to implement an effective and comprehensive EDI program. Both the business case and the additional information are presented in the remaining chapters and several appendices.

- ◆ Chapter 2 describes DeCA's organizational structure and current business practices; it also provides important background material for the remaining chapters of the report.
- ◆ Chapter 3 identifies and describes DeCA's key EDI opportunities.
- ◆ Chapter 4 presents detailed EDI operating concepts and two technical architectures (interim and long term) to guide DeCA's implementation efforts.
- ◆ Chapter 5 analyzes the costs and benefits of each EDI opportunity identified in Chapter 3. It also proposes a list of EDI priorities.
- ◆ Chapter 6 describes the tasks DeCA needs to undertake to implement EDI. It also contains a preliminary implementation plan and schedule.

Finally, the appendices provide a variety of detailed information (such as a listing of DeCA stores, a listing of key external trading partners, and discussion of work flows and savings worksheets) that support the analysis presented in the body of the report.

CHAPTER 2

Overview of the Defense Commissary Agency

BACKGROUND

Dating back to 1826, when Congress authorized the Army to sell food at cost to officers stationed in isolated areas, the DoD commissary system is one of the oldest and most important institutions in the U.S. Military. That system began to resemble its current structure following the massive troop mobilizations in World Wars I and II. As of July 1993, DeCA operates 369 commissary stores worldwide and conducts business with more than 6,500 commercial manufacturers and distributors.

The DeCA's principal mission is to "operate the most efficient and effective commissary system to enhance military readiness and retention of quality personnel by providing a non-pay benefit, which improves the quality of life of our patrons." Recent surveys indicate that DeCA has been successful in satisfying that mission — military personnel regard commissary privileges and health care as the two most important components of the military benefits package. DeCA strives to offer the same items as commercial grocery stores but at a substantial discount, often 25 percent or more. It also tries at overseas commissaries or those in remote locations to supply grocery items that cannot be purchased locally.

Another important DeCA mission is to "operate designated worldwide troop subsistence supply functions and field functions in both peacetime and war." Although the Defense Personnel Support Center (DPSC) is responsible for much of the DoD subsistence mission, DeCA assists DPSC in ordering, storing, issuing, and accounting for subsistence items in support of fighting units worldwide.

Defense commissaries have been studied many times over the past three decades. Of particular note are the Bowers Commission (1975) and the Jones Commission (1989). Both of those commissions recommended that the commissary system, which traditionally consisted of separate stores operated by the Military Services, be combined into a centrally managed organization. In response to the Jones Commission, the DoD created DeCA in January 1991 as a separate agency, reporting directly to the ASD(P&L).

ORGANIZATIONAL STRUCTURE

The DeCA employs a multitiered organizational structure to support its store operations. In addition, two external agencies [the Defense Finance and Accounting Service (DFAS) and DPSC] play an important role in helping DeCA carry out its primary missions. The roles and responsibilities of both DeCA and these non-DeCA activities are described in more detail below.

Organization

Figure 2-1 provides an overview of the DeCA organization. The headquarters, located at Ft. Lee, Virginia, is responsible for commanding and centrally managing the DeCA worldwide commissary system through seven commissary regions located in the United States and Europe. With a staff of 355, it carries out a variety of responsibilities, including planning and analysis, resource and acquisition management, training, public affairs, and legal support.

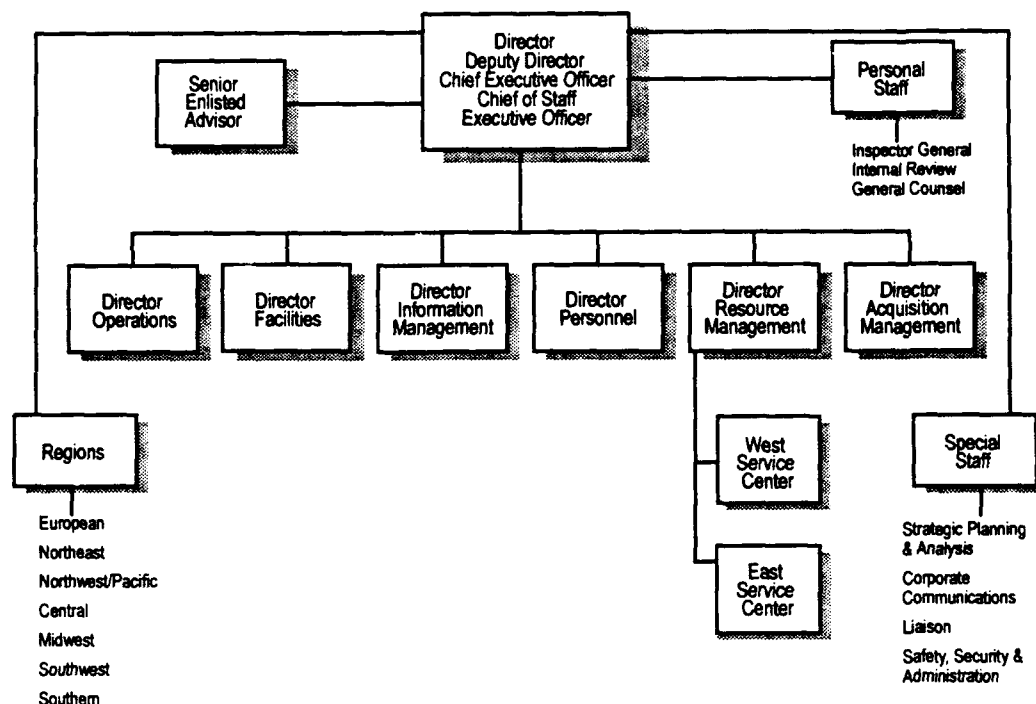


Figure 2-1.
DeCA Organizational Structure

Service Centers

The DeCA operates two service centers: the East Service Center, located at Ft. Lee, Virginia; and the West Service Center at Kelly Air Force Base in San

Antonio, Texas. Each service center provides support to Headquarters, DeCA, and the regions, districts, and commissaries in the following areas: bill paying, computer system development, automated data processing, and contracting. The East Service Center provides bill-paying support for the regions, districts, and commissaries east of the Mississippi River and for Headquarters, DeCA, as well as contracting support for all nonresale commissary procurements (including operational equipment, supplies, and services). The West Service Center supports bill-paying efforts for all regions, districts, and commissaries west of the Mississippi River. It also manages contracts for all DeCA resale (i.e., grocery-related) procurement actions.

Regions

The seven DeCA regions are responsible for providing technical assistance, training, and direction for all resale and troop issue functions for the stores within their jurisdictions. They are also assuming responsibility for many item pricing/maintenance functions formerly carried out by individual commissaries. Table 2-1 shows the location of the region headquarters, along with the number of stores in each region and their total sales in FY92.

Table 2-1.
DeCA Regions (1992)

| Region | Headquarters | Number of stores | FY92 sales (\$000) |
|-------------------|------------------|------------------|--------------------|
| European | Kapuan, Germany | 119 | 664,177 |
| Northeast | Ft. Meade, MD | 47 | 769,776 |
| Northwest/Pacific | Ft. Lewis, WA | 56 | 801,293 |
| Central | Little Creek, VA | 42 | 849,602 |
| Midwest | Kelly AFB, TX | 42 | 916,127 |
| Southwest | El Toro, CA | 52 | 976,628 |
| Southern | Maxwell AFB, AL | 53 | 1,046,921 |
| Total | — | 411 | 6,024,524 |

Note: AFB = Air Force Base.

Source: Interservice, Winter 1993.

Some of the regions are further subdivided into districts, primarily to reduce the span of control in the larger regions. Each district manager, acting under the direct supervision of the region commander, manages a number of commissaries. Only three regions — Southwest, Central, and Midwest — employ the district structure within CONUS. Three of the regions have overseas district offices: the Southern region has one in Panama, the Northwest/Pacific region has district

offices in Korea and Hawaii, and the European region has three district offices in Germany and another in the United Kingdom.

Stores

The DeCA currently operates 369 stores, although that number will likely decline after the Base Realignment and Closure Commission completes its study. (Appendix A provides a listing of all DeCA stores that were in operation in 1992.)

Each store is responsible for ordering, stocking, and inspecting all commissary items and for managing commissary operations. Many stores have an attached warehouse for additional inventory, but these warehouses are being replaced in part by continuous replenishment techniques such as direct store delivery (DSD), frequent delivery system (FDS), and central distribution centers (CDCs). Although troop issue is principally the responsibility of DPSC, DeCA stores also prepare local-purchase, troop-issue price lists and provide troop support warehouse space. Each CONUS region maintains a subsistence branch for carrying out assigned subsistence responsibilities.

Central Distribution Centers

The DeCA uses CDCs to distribute semiperishable warehouse items to all commissaries within a specific geographical area. Manufacturers or their designated distributors make deliveries to CDCs on a weekly, biweekly, or monthly basis. Although DeCA currently operates 16 CDCs, that number is expected to decrease in the future.

External Activities

Two external DoD activities — DFAS and DPSC — play an important role in DeCA's operations. DFAS supports DeCA in carrying out its payroll, nonresale invoicing, and payment functions. Established in 1991, DFAS has assumed DeCA's bill-payment responsibilities at its Columbus Center (DFAS-CO). (DFAS-CO is also responsible for all DoD centrally administered contractor payments.) Although DFAS-CO disburses DeCA payments, DeCA remains responsible for invoice reconciliation until DFAS-CO upgrades its applications systems, which may occur in 1994.

The DPSC plays a significant role in commissary contracting and procurement activities. DPSC's Directorate of Subsistence is responsible for contracting and distributing food for both DoD commissaries and mess halls (i.e., troop issue). Although not required, most commissaries use DPSC's contracting and procurement capabilities in one way or another. Overseas commissaries rely almost exclusively on DPSC for ordering, while CONUS commissaries order brand name items (approximately 50 percent of total volume) using the

DPSC-maintained Subsistence Supply Bulletin. Seventy percent of all DeCA stores use a DPSC-negotiated contract to procure meat, dairy, and bakery items; in addition, most commissaries in CONUS use DPSC contracts to procure fresh fruits and vegetables.

BUSINESS PRACTICES

Delivery Systems

The DeCA uses four distinct business practices to deliver items to its stores – FDS, DSD, direct store delivery-s (DSD-S), and CDC. These business practices are described in some detail in the following subsections.

FREQUENT DELIVERY SYSTEM

Figure 2-2 depicts the operation of DeCA's FDS. DeCA uses FDS to deliver approximately 75 percent of its line items. Under FDS, manufacturers typically use distributors who make an average of three to four deliveries per week to a particular store. FDS is usually reserved for high-turnover items except those that are highly perishable. At periodic intervals, a store employee takes inventory of FDS items using a hand-held computer. Data from the hand-held are downloaded into a computer at the store and transmitted to the distributor through a modem, who in turn delivers the items to the store. The distributor's inventory is replenished periodically by the manufacturer, based on stock levels and consumption.

DIRECT STORE DELIVERY

Although currently used for only about 15 percent of all DeCA line items, DSD is on the rise, both for DeCA and for the grocery industry. DSD is similar to FDS except for three key differences. First, primarily manufacturers, not distributors, make the deliveries. Second, DeCA tends to reserve DSD for fresh, perishable, and very-high-turnover items such as dairy products, cookies, snack foods, and soda. Third, the manufacturer, not the store, is responsible for stock replenishment and inventory. The manufacturer's representative typically visits the store on a daily or near-daily basis, takes inventory (often using a hand-held computer), and replenishes particular items as required. The representative then gives the store a copy of the delivery ticket. The store enters the information contained on the delivery ticket into DIBS and transmits it to the service center. Figure 2-3 illustrates DSD operations.

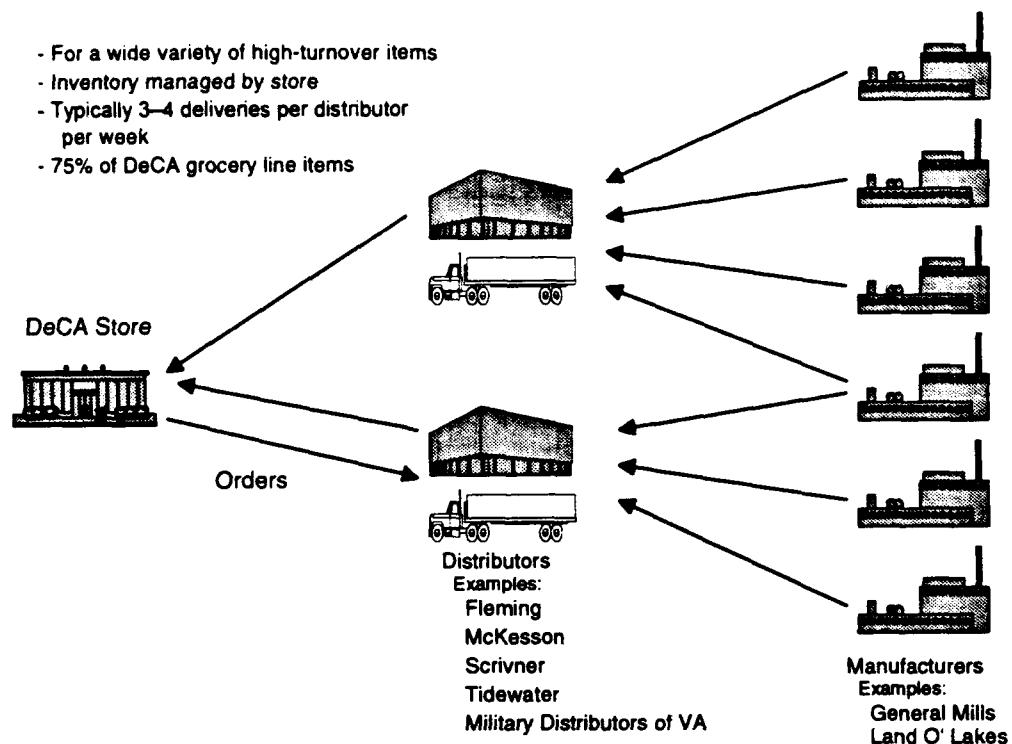


Figure 2-2.
Frequent Delivery System

DIRECT STORE DELIVERY-S

Direct store delivery-s combines features from both DSD and FDS. Like DSD, DSD-S deliveries are made directly from the distributor to the store (see Figure 2-4). However, like FDS, the quantity is typically determined prior to the delivery taking place. DeCA uses DSD-S for items that are not rolled up biweekly, typically having net 7 and 10 day payment terms. The receipts are key entered by call as they are delivered. Currently, DSD-S deliveries comprise only a small percentage (less than 1 percent) of DeCA line items.

- For fresh, perishable, and very high turnover items (e.g., dairy products, soda, snack food)
- Manufacturers responsible for replenishment and display of allocated shelf space
- Typically 1 to 6 deliveries per week per manufacturer
- 15% of DeCA line items

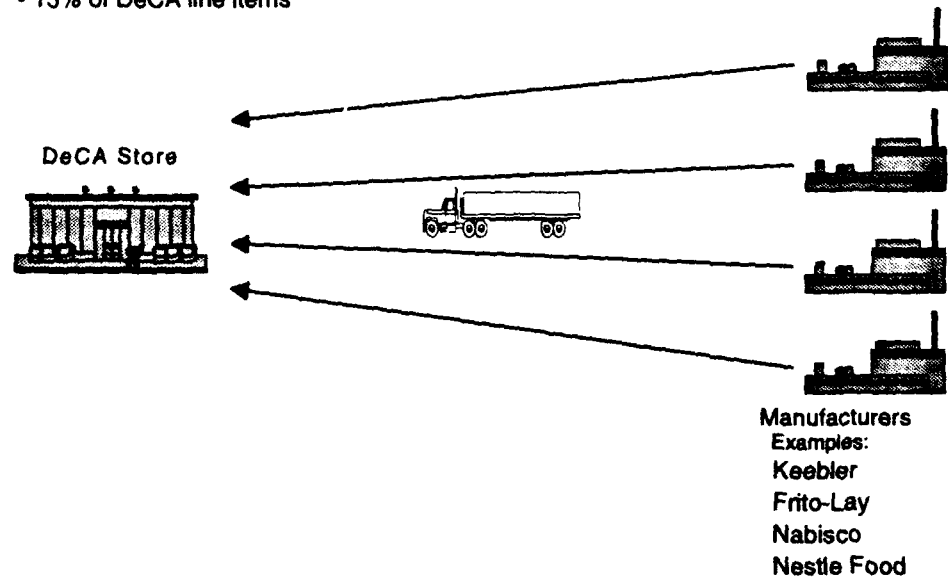


Figure 2-3.
Direct Store Delivery

- For items with net 7 and 10 day payment terms
- Manual ordering process
- Small percentage of DeCA line items
- Inventory and ordering managed by store

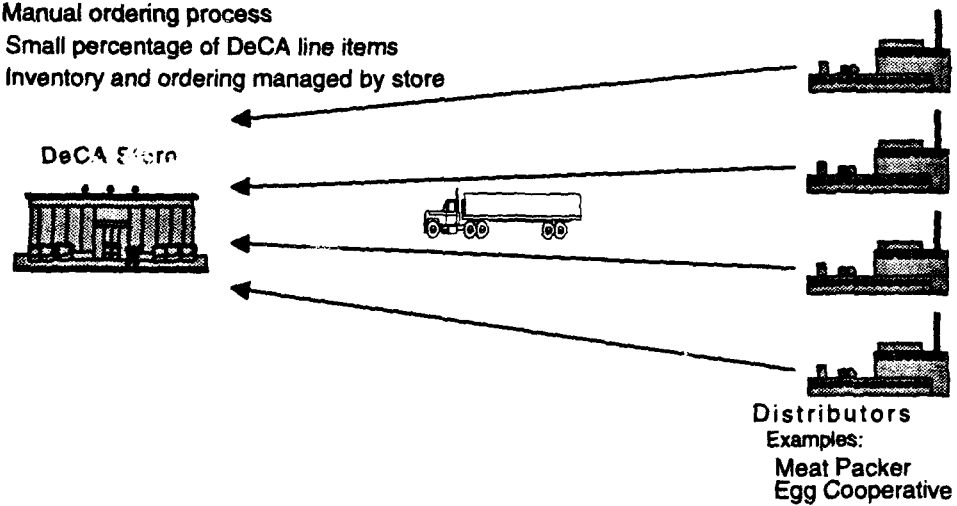


Figure 2-4.
Direct Store Delivery-S

CENTRAL DISTRIBUTION CENTERS

The CDC ordering process (see Figure 2-5) is identical to that of FDS, with store employees taking inventory and then ordering needed items from the CDC. DeCA uses CDCs mostly to distribute low-turnover items (about 10 percent of all line items). CDCs strive to maintain a 30-day inventory of all stocked items. CDCs replenish their inventory periodically from the manufacturer, based on stock levels and consumption. DeCA currently operates 8 CDCs, though their number is declining.

- For a wide variety of low-turnover items
- Inventory and ordering managed by store
- Deliveries per week vary depending on store's location
- 10% of DeCA line items

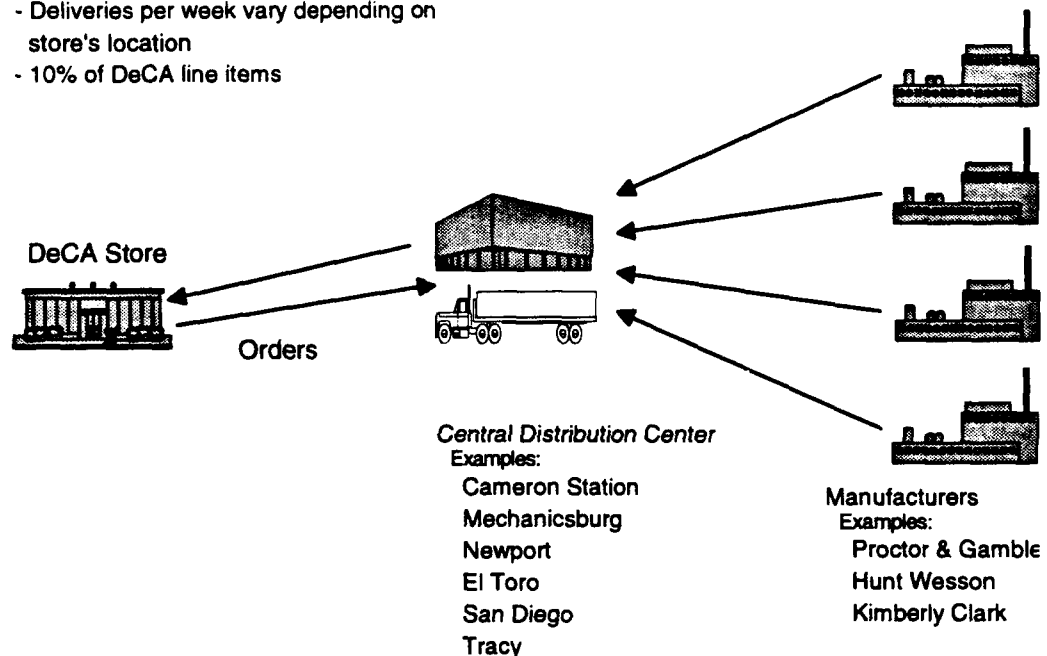


Figure 2-5.
Central Distribution Center Deliveries

Key Documents and Transactions

Each year, DeCA generates more than 21 million paper and electronic transactions. Table 2-2 lists some of the key DeCA documents by functional area. Many of those documents (such as the contract documents and the voucher stub and check) are already targeted for replacement by EDI in DMRD 941. In addition, all DeCA invoices and delivery tickets are commercial documents, and all CDC and FDS ordering is accomplished automatically through the use of hand-held computers at the store level.

Table 2-2.
Key DeCA Documents and Transactions

| Functional area | Document/transaction | Annual volume (000) |
|--------------------------|----------------------------------|---------------------|
| Invoice | Commercial invoice | 2,700 |
| Payment | Voucher stub and check | 1,800 |
| Item pricing/maintenance | Price quote sheet | 648 |
| Order | Electronic (hand-held computers) | 13,375 |
| Receipt | Commercial delivery ticket | 2,700 |
| New contracts | SF 26/DD Form 1155 | 6 |
| Contract modifications | SF 26/DD Form 1155 | 25 |
| Total | — | 21,254 |

Note: SF = Standard Form; DD = Defense Document.

Trading Partners

In carrying out its mission, DeCA exchanges information with a large variety of trading partners. Some are commercial manufacturers or distributors (referred to as external trading partners), while others are DoD activities (or internal trading partners).

Appendix B shows DeCA's top 700 external trading partners in terms of the number of invoices generated during a 3-month period (from August through October 1992). During that period, DeCA received approximately 628,000 invoices from more than 6,200 manufacturers. The 700 largest manufacturers accounted for 90 percent of DeCA's total invoice volume. Further, almost 2,100 manufacturers (one-third of the total) sent DeCA one or more invoices per week.

Regarding its internal trading partners, DeCA will soon exchange information with both DPSC and DFAS-CO. Using the Electronic Data Interchange Catalog Transaction (EDICT) system, DPSC will send either supply bulletin or contract information electronically to DeCA. Also, DeCA will begin sending voucher file information directly to DFAS-CO for payment in the near future. When DFAS-CO assumes responsibility for invoice reconciliation, the need for DeCA to transmit voucher file information to DFAS-CO will be eliminated.

Automated Systems

DeCA INTERIM BUSINESS SYSTEM

The DeCA Interim Business System (DIBS), an improved version of the District Oriented Store System (DOSS) used by the Army in Europe, is DeCA's core

business system. Designed to replace the various Military Service-specific systems currently in use throughout DeCA, DIBS supports a variety of functions: ordering, receiving, shelf stock replenishment, physical inventory, and control operations (such as reports of deposit, demand reporting, and file maintenance).

Of the control functions, file maintenance is perhaps the most important. The DIBS regional file maintenance (RFM) function allows DeCA to maintain a single, centrally managed item data base. Prior to DIBS, the stores maintained their own data bases. Consequently, if the stores within a particular region wanted to add an item, each store had to update its data base. With DIBS, DeCA adds the item only once, dramatically reducing the amount of data entry time and the frequency of errors.

The DeCA began to implement selected DIBS functions – particularly RFM – in October 1992 in its Southwest and Northeast regions. By the end of August 1993, DIBS is scheduled to be fully implemented in the Southwest region. DeCA plans to have all commissaries using DIBS by March 1994.

DEFENSE COMMISSARY INFORMATION SYSTEM

The Defense Commissary Information System (DCIS) will replace DIBS beginning in 1995. Like DIBS, DCIS will consolidate, automate, and enhance DeCA's business functions. It will automate store, region, and distribution center operations related to identifying, buying, storing, and selling subsistence. At the store and CDC levels, DCIS will have a number of features such as computer-assisted ordering and receiving; interfaces to hand-held computers; and automatic time and attendance, labor scheduling, inventory management, buying, and warehousing operations.

The seven regions and Headquarters, DeCA, will use DCIS primarily for decision support and management purposes. Although DCIS will not handle functions such as property/equipment management, personnel, or contracting, it will provide an interface to other automated DoD systems that are used to manage those areas.

STANDARD AUTOMATED VOUCHER EXAMINATION SYSTEM

The Standard Automated Voucher Examination System (SAVES) reconciles vendor invoices and commissary receiving reports. When a commissary receives a shipment, it enters delivery ticket (i.e., receipt) information into DIBS, which then passes it automatically to SAVES. Invoice information sent by manufacturers is keyed into SAVES at either the East or West Service Center and then matched with delivery ticket information as part of the invoice reconciliation process. If no problems are encountered, SAVES transmits a voucher file to DFAS-CO, where it is used to make a payment. If problems are encountered,

then the service center contacts either the store or the manufacturer for further information.

STANDARD FINANCIAL SYSTEM - REDESIGN 1

The Standard Financial System - Redesign 1 (SRD-1) is principally a disbursing system. It resides at DFAS and is the last step in the payment process. DeCA uses SAVES to prepare voucher files (containing vendor and payment information, such as the check and voucher numbers and accounting category). SRD-1 adds the disbursing information required before a check can be issued. Links between DeCA's accounting systems and SRD-1 ensure that all payments are charged to their proper accounts.

STANDARD AUTOMATED CONTRACTING SYSTEM - DeCA

The Standard Automated Contracting System - DeCA (SACONS-D) is DeCA's primary contracting system. By maintaining an inventory of contractual clauses and provisions, SACONS-D automatically generates and updates procurement documents. DeCA uses SACONS-D to award and administer formal resale, supply, equipment, and service contracts and to initiate small-purchase actions for administrative supplies/equipment.

Electronic Commerce Initiatives

Electronic Commerce - the use of EDI and other electronic tools to automate business functions - is not a new concept to DeCA. Both DeCA and its DoD trading partners have either launched or plan to launch several such initiatives. Some of these are described below.

DFAS-CO EDI PROGRAM

A 1990 study by LMI indicated that for an investment of approximately \$2.1 million, DFAS-CO could implement a comprehensive EDI program that would conservatively save more than \$60 million over a 10-year period.¹ In the spring of 1993, DFAS-CO expects to launch the first phase of that program when it begins to receive commercial invoices electronically from several trading partners. In future phases, DFAS-CO will expand its EDI program to include progress payments and public vouchers, status and acceptance reports, and contracts. Because DFAS-CO will soon assume responsibility for DeCA invoice reconciliation and payment, the DFAS and DeCA EDI programs must be closely coordinated.

¹ LMI Report DL001-02R1, *An Electronic Commerce Program for the Defense Finance and Accounting Service - Columbus Center*, Hardcastle, Thomas P. and William R. Ledder, May 1991.

ELECTRONIC INVOICING PROGRAM

The DeCA is currently testing an electronic invoicing system using the ASC X12 Transaction Set 810, *Invoice*. In February 1993, after a full year of planning, the East Service Center successfully tested this system with the R. J. Reynolds Tobacco Company using the BT TymNet EDI value-added network (VAN). The West Service Center was added to the test in March 1993. DeCA plans to add an additional 22 vendors to its electronic invoicing program by the end of FY93. Before it can significantly expand the program, however, DeCA needs to develop and implement a comprehensive EDI architecture and telecommunications strategy. (Chapter 4 proposes such an architecture and strategy in some detail.)

DOCUMENT IMAGING

Both DFAS and DeCA plan to use document imaging technologies to complement their ongoing EDI efforts. In FY92, DFAS invested \$900,000 to develop a pilot imaging system. That system and future DFAS imaging systems will focus on automating the storage and retrieval of contract file information, principally the paper required to initiate, record, document, and store vendor payment transactions. Further, DFAS plans to use imaging to retrieve EDI-transmitted information in a standard form or template for review. DeCA is likely to use a similar strategy in employing imaging technologies.

ELECTRONIC SUPPLY BULLETIN

As noted previously, DPSC has developed the EDICT system to automate its Subsistence Supply Bulletin. EDICT currently provides brand name price information to some DPSC customers, including the Northwest/Pacific Region of DeCA. Approximately 200 manufacturers are now sending price changes, promotions, and item maintenance information (using ASC X12 Transaction Sets 879, *Price Change*; 888, *Item Maintenance*; and 889, *Promotion Announcement*) to DPSC. DPSC is also using EDICT to transmit purchase orders electronically to 92 manufacturers and is testing electronic invoicing with a small number of vendors. In the near future, DeCA regions will receive all supply bulletin information through EDICT.

SUMMARY

The DeCA is a large, complex organization (more than 350 stores spread throughout 7 regions worldwide) with a variety of business practices (FDS, DSD, DSD-S, and CDC). Combined, DeCA activities process more than 21 million transactions each year with more than 6,500 commercial trading partners. Although much of its energy over the past 2 years has been devoted to consolidating the individual commissary functions of the Military Services, DeCA is

nonetheless highly automated and rapidly gaining experience with Electronic Commerce through ongoing EDI and imaging initiatives.

In the next chapter, we examine DeCA's six key functional areas (contracting, ordering, receiving, invoicing, payment, and item pricing/maintenance) for purposes of developing a preliminary list of EDI opportunities.

CHAPTER 3

EDI Opportunities

INTRODUCTION

This chapter builds upon the preceding overview of DeCA's operations. In it, we assess the prospects for expanding DeCA's use of EDI and electronic funds transfer (EFT) to carry out its missions. Our assessment uses criteria frequently employed in both the private and public sectors to evaluate EDI opportunities. We conclude by identifying the DeCA mission areas that offer the best long-term prospects for EDI.

EDI FEASIBILITY CRITERIA

Recent experience in the private and public sectors shows that the following four criteria are increasingly being used to determine whether a specific application is a suitable candidate for EDI:

- ◆ Volume
- ◆ Trading partner capabilities
- ◆ Internal automation
- ◆ Business practices.

Volume (i.e., the number of paper transactions) is often regarded as the single most important criterion. That conclusion is based upon the simple assumption, confirmed in numerous studies, that electronic processing of business transactions is less costly than paper processing. EDI applications that replace the most paper offer the greatest cost savings, all other things being equal.

An organization's trading partner profile must be considered in conjunction with volume. For example, if transaction volume is spread thinly over a large number of trading partners, then the prospects for EDI are poor. (We generally use at least one transaction per week as the threshold for justifying an EDI relationship with a particular trading partner.) Further, organizations cannot achieve the cost savings potential promised by EDI without long-term, stable relationships with EDI-capable trading partners.

Internal automation is also important. An organization must have the capability to receive and process EDI transactions. Its trading partners also require

the same capability. Without such a capability, EDI is little more than a communications medium that may lead to higher processing costs.

Finally, an organization's specific business practices must also be considered. For example, DeCA uses four separate business practices to order and deliver items to its stores. EDI operating concepts and transactions must be tailored to accommodate and enhance those practices. In addition, many organizations have found that they cannot make effective use of EDI without re-engineering their business practices or implementing new procedures and technologies.

OPPORTUNITY ANALYSIS

In this section, we apply the EDI feasibility criteria to each of DeCA's main functional areas – contracting, ordering, receiving, invoicing, payment, and item pricing/maintenance – to determine if any of those areas has the potential to make full use of EDI techniques.

Contracting

The contracts that DeCA issues are divided into two categories: resale (grocery items) and nonresale (items that support grocery operations such as facility construction and purchase of grocery bags). DeCA uses two documents to support both types of contracts: SF 26, *Contract Award*, and DD Form 1155, *Order for Supplies and Services*.

For resale contracts, DPSC issues an SF 26 for items on the Subsistence Supply Bulletin, while DeCA uses the same document for items negotiated directly with manufacturers. After the award of a resale contract, DeCA uses a DD Form 1155 to establish a blanket delivery order with a manufacturer. DeCA also issues an SF 26 for nonresale contracts.

Although DeCA manages approximately 17,000 resale contracts, the annual volume of both documents is relatively low when compared to the number of orders, invoices, and receipts that DeCA processes. Furthermore, because the contract file attached to it is voluminous, the SF 26 presents special problems from an EDI perspective. Both DeCA and DFAS-CO are exploring the use of imaging technologies to store and transmit contract file information as an alternative to EDI.

Ordering

The DeCA processes more orders (in excess of 13 million per year) than all other transactions combined. Much of that processing, however, is already automated, which suggests a relatively small payback from implementing EDI. DeCA

currently collects FDS and CDC order information (85 percent of all orders) using hand-held computers and electronically transmits that information to the appropriate manufacturer, distributor, or CDC. (All DSD orders, the remaining 15 percent, are processed directly by manufacturers, also using hand-held computers.) Still, DeCA may realize some benefits by converting order transactions from the current proprietary formats to the more widespread and standard ASC X12 transaction sets.

Receiving

The delivery ticket (DeCA's key receiving document) represents an excellent EDI opportunity. With an annual volume of more than 5 million, the delivery ticket is one of DeCA's most frequently used documents. It also is processed manually and generates many errors. In particular, DeCA must verify item amounts because they form the basis for payment to manufacturers. If the item amount specified in the order does not match the amount on the delivery ticket, the discrepancy must be resolved during the invoice reconciliation process. Under DeCA's Delivery Ticket Invoicing (DTI) program, reconciliation of smaller DSD shipments occurs at the receiving dock where a mistake is easier to catch and correct. Larger shipments (such as those that typically occur with FDS and CDC orders) cannot be reconciled on the receiving dock because the in-checking process is much more complicated.

Evaluated receipt settlement takes DTI one step further by electronically replacing the paper delivery ticket with an EDI transaction such as the advance shipment notice. That transaction eliminates the need to manually enter delivery information into DeCA systems. As with DTI, reconciliation occurs at the receiving dock.

Invoicing

Manufacturers send approximately 2.7 million commercial invoices to DeCA each year for processing and payment. Although DMRD 941 did not specifically target commercial invoices, they represent an excellent EDI candidate for DeCA. Their volume is high and their format is relatively simple (i.e., they contain little textual or interpretative material). In addition, both DFAS-CO and DeCA have successfully tested replacing commercial invoices with the ASC X12 Transaction Set 810, *Invoice*.

The DeCA's trading partner profile in the invoicing area is also highly favorable for EDI. While DeCA receives invoices from more than 6,500 commercial manufacturers, 700 manufacturers (slightly more than 10 percent of the total vendor pool) account for 90 percent of those invoices. Many of those manufacturers have significant EDI experience.

Until it assumes direct responsibility for the invoice reconciliation function, DFAS-CO will receive voucher file information electronically (through SAVES)

from DeCA. In addition, DFAS-CO is implementing an ambitious EDI program (beginning with electronic invoicing) and should eventually be well-positioned to receive invoice information directly from DeCA manufacturers.

Payment

The payment area is another excellent EDI candidate. DeCA uses the voucher stub and check (both DMRD 941 documents) to make payments. The large number of payments and the favorable payment trading partner profile (almost identical to that for invoices) make this area conducive to EDI. Finally, a wide variety of transaction sets have been successfully applied to support electronic payment. They include the ASC X12 Transaction Set 820, *Payment Order/Remittance Advice*, and three National Automated Clearinghouse Association (NACHA) formats – CCD+, CTP, and CTX.¹ DFAS-CO is now responsible for all DeCA disbursements.

Item Pricing/Maintenance

Manufacturers frequently change the packaging of specific grocery items. In addition, promotions, sales, and coupon usage routinely alter the price of many items. Thus, DeCA devotes significant resources to item pricing/maintenance activities, primarily at its regional offices. It also processes more than 1.1 million price quote sheets for item pricing/maintenance actions each year. Although not specifically targeted in DMRD 941, the price quote sheets nonetheless represent an excellent EDI candidate for DeCA. Several ASC X12 transaction sets already have been developed to replace those sheets with electronic transmissions: 878, *Product Authorization/De-Authorization*; 879, *Price Change*; 888, *Item Maintenance*; and 889, *Promotion Announcement*.

BUSINESS PRACTICES

For some DeCA functional areas, implementing EDI will be principally a matter of automating existing manual processes such as data entry, document distribution, and document transmission. For others, however, DeCA may need to re-engineer some of its business practices to garner the full benefits from EDI. Three areas where such business improvements may be possible are DIT (sometimes referred to as Evaluated Receipt Settlement); point-of-sale data; and the introduction of direct exchange (DEX) EDI for processing DSD-type deliveries at the receiving dock.

¹ CCD+ = Cash Concentration or Disbursement with Special Addendum; CTP = Corporate Trade Payment; CTX = Corporate Trade Exchange.

Delivery Ticket Invoicing

Delivery Ticket Invoicing uses the delivery ticket as a basis for payment, eliminating the invoice from the bill-paying process. Currently, DeCA uses DTI only for DSD-S (net 7 and net 10) shipments, principally because they tend to be smaller and easier to check-in than larger FDS or CDC deliveries. DTI is possible only if the delivery ticket contains all 12 data elements required to pay the invoice. It requires both the manufacturer and DeCA to verify delivery amounts at the receiving dock. Delivery ticket information is then manually entered into DIBS and transferred to SAVES, where it is then used as the basis for payment. The manufacturer does not submit an invoice. Further, the reconciliation process at the service center is eliminated because it already has occurred at the receiving dock.

The use of DTI has a number of benefits. It eliminates the invoice and all associated processing and mailing costs (see Chapter 5 and Appendix C for invoice processing steps and costs), including the costly reconciliation process. (Reconciliation may still be required when the price of the item delivered does not match the price allowed in the contract or supply bulletin.) It also speeds up vendor payments.

The main factor limiting the expansion of DTI is the check-in process. The on-the-spot verification process is crucial to the success of DTI. Large deliveries, however, can significantly slow down the process when every item in the shipment must be recorded. By making advance ship notice information available on the receiving dock, shipment details will be known and captured electronically prior to delivery. This allows receiving to compare the shipment to the advance ship notice and record only the exceptions rather than the whole shipment. This could speed up the check-in process and thus permit DeCA to use DTI for larger FDS and CDC shipments.

Point-of-Sale Data

Point-of-sale (POS) data can provide DeCA with extremely accurate and timely information about customer consumption patterns. Under this practice, each item is passed through a scanner during check-out. The scanner records the Universal Product Code (UPC) of all products purchased and automatically adjusts inventories. In a true POS operating environment, DeCA would transmit its POS data to distributors and manufacturers that would then adjust their orders to match the needs of each store. By using this information to forecast short- and long-term demands for certain products, manufacturers may be able to significantly reduce their inventories.

By capturing POS data, DeCA would substantially reduce the number of orders that it places each year (currently 13 million). It would also reduce one of the most labor-intensive features of DeCA's ordering process — taking inventory of store shelves. It could even reduce the need for CDC warehouses. Further,

POS order generation is technically simple to implement, and the commissaries already have much of the equipment necessary for transmitting POS data.

Nevertheless, DeCA's use of POS data may be controversial. For example, the use of POS data could give an unfair advantage to the larger manufacturers and distributors at the expense of smaller firms. Therefore, DeCA needs to implement POS ordering with caution.

Direct Exchange

Direct exchange describes the computer-to-computer exchange of EDI transactions between a supplier and retailer *at the receiving dock*. Unlike most traditional EDI transactions, DEX does not use either VANs or commercial phone lines.

In a typical FDS or CDC delivery, the shipment amount is determined before the truck arrives at the store's receiving dock. For DSD, however, the delivery amount is not known until *after* the manufacturer arrives at the store and performs an inventory of its particular shelf items. Usually, the manufacturer keys inventory and delivery quantities into a hand-held computer. DEX would allow DeCA to take the delivery information from that hand-held computer and upload it (in an EDI format) directly into DIBS at the store's receiving dock. It would also permit the manufacturers to upload that same information directly into their computers.

By using DEX, DeCA could realize many benefits: expanded use of DSL, elimination of the manual entry of DSD receiving information, and fewer DSD invoice reconciliations. The main drawback to DEX is cost. Each of DeCA's 369 stores would need to purchase a hand-held computer to support DEX as well as a DEX-port, at a cost of approximately \$1,500 per store. Also, DEX is still new to the grocery industry and is used by only a few manufacturers.

SUMMARY

In this chapter, we used several criteria to assess the potential of applying EDI to DeCA's business practices. Four areas — receiving, invoicing, payment, and item pricing/maintenance — appear to be excellent EDI candidates. All four require extensive manual processing, have high document volumes, and have corresponding EDI transaction sets that either the grocery industry or the DoD have successfully tested. Further, all four share the same highly concentrated trading partner profile.

The EDI prospects for the remaining two areas are unclear. Contracting has a relatively low transaction volume and uses documents that are not easily translated to EDI. Imaging technologies may be better suited for this area. In the ordering area, DeCA has already automated much of its processing through the use of hand-held computers. Although DeCA may benefit by migrating from the

proprietary formats used by those hand-held computers to the more standard ASC X12 transaction sets, the associated savings may be small in spite of the large number of transactions.

In the next chapter, we propose specific EDI operating concepts for each opportunity area.

CHAPTER 4

EDI Operating Concepts

INTRODUCTION

In Chapter 3, we identified six business areas within DeCA that may have potential for significant improvement through the use of EDI: contracting, ordering, receiving, invoicing, payment, and item pricing/maintenance. In this chapter, we propose specific EDI operating concepts for each of those areas.

Our operating concepts consist of two parts. The first addresses the information flows and associated EDI transaction sets. We propose five separate information flows: one for contracting and item pricing/maintenance; three for ordering and receiving (FDS, CDC, and DSD); and one for invoicing and payment. The second part considers the technical configuration (hardware, software, and communications) required to implement the information flows. We believe that DeCA needs only two technical configurations (interim and long term) to support the five information flows.

EDI INFORMATION FLOWS

Table 4-1 identifies 17 ASC X12 and Uniform Communication Standard (UCS) transaction sets required to implement the five EDI information flows. It also summarizes the purpose of each transaction set and identifies the documents that it would replace. Fortunately, DoD implementation conventions already exist for five of those transaction sets: ASC X12 Transaction Set 856, *Ship Notice/Manifest*; ASC X12 Transaction Set 810, *Invoice*;¹ ASC X12 Transaction Set 820, *Payment Order/Remittance Advice*; ASC X12 Transaction Set 997, *Functional Acknowledgment*; and ASC X12 Transaction Set 824, *Application Advice*.

In describing the proposed EDI information flows, we first present a figure that illustrates the flow of EDI information for a particular functional area or areas (we combined related functional areas when appropriate) and identifies the transaction sets used to accomplish that flow. We then describe the flow in approximate chronological order of occurrence, which is indicated by the numbers in brackets.

¹Three separate DoD 810 conventions have been created: 810, *Commercial Invoice*; 810, *Progress Payments*; and 810, *Public Voucher*.

Table 4-1.
EDI Transaction Sets Required by DeCA

| Functional area | Transaction set | Title | Functional application | Document |
|--------------------------|--------------------------|--|--|-----------------------------|
| Contracting | ASC X12 836 ^a | Contract Award | Notice of contract award | DD Form 1155, SF 26 |
| | ASC X12 832 | Price/Sales Catalog | Product description | Price Sales Catalog |
| Ordering | UCS 875 ^b | Purchase Order | Order items from manufacturer or distributor | |
| | UCS 876 ^b | Purchase Order Change | | |
| | ASC X12 894 (DEX) | Delivery/Return Base Record | Product delivered via DSD | |
| | ASC X12 856 | Ship Notice/Manifest | Advance shipment notice | |
| | ASC X12 855 | Purchase Order Acknowledgment | Vendor confirms receipt of purchase order | |
| Receiving | ASC X12 856 | Ship Notice/Manifest | Inform manufacturer of delivery | Delivery ticket |
| | ASC X12 867 | Product Transfer and Resale Report | Distributor informs manufacturer of exact delivery amount for billing purposes | |
| | ASC X12 895 (DEX) | Delivery/Return Acknowledgment and/or Adjustment | Confirmation of delivery amount | |
| Invoicing | ASC X12 810 | Invoice | Invoice, progress payment | Commercial Invoice, SF 1411 |
| Payment | ASC X12 820 | Payment Order/Remittance Advice | Payment/invoice status Postpayment remittance advice | Check/voucher |
| Item pricing/maintenance | ASC X12 878 | Product Authorization/De-Authorization | Notify vendors of change in product status | Price quote sheet |
| | ASC X12 879 | Price Change | Price change | Price quote sheet |
| | ASC X12 888 | Item Maintenance | Item maintenance | Price quote sheet |
| | ASC X12 889 | Promotion Announcement | Promotion announcement | Price quote sheet |
| All | ASC X12 997 | Functional Acknowledgment | Acknowledge receipt of transaction sets | |
| | ASC X12 824 | Application Advice | Confirm receipt by applications system | |

^a May use ASC X12 561, *Contract Abstract*, (MODELS) as an alternative.

^b May use ASC X12 850, *Purchase Order*, and ASC X12 865, *Purchase Order Change*, as alternatives.

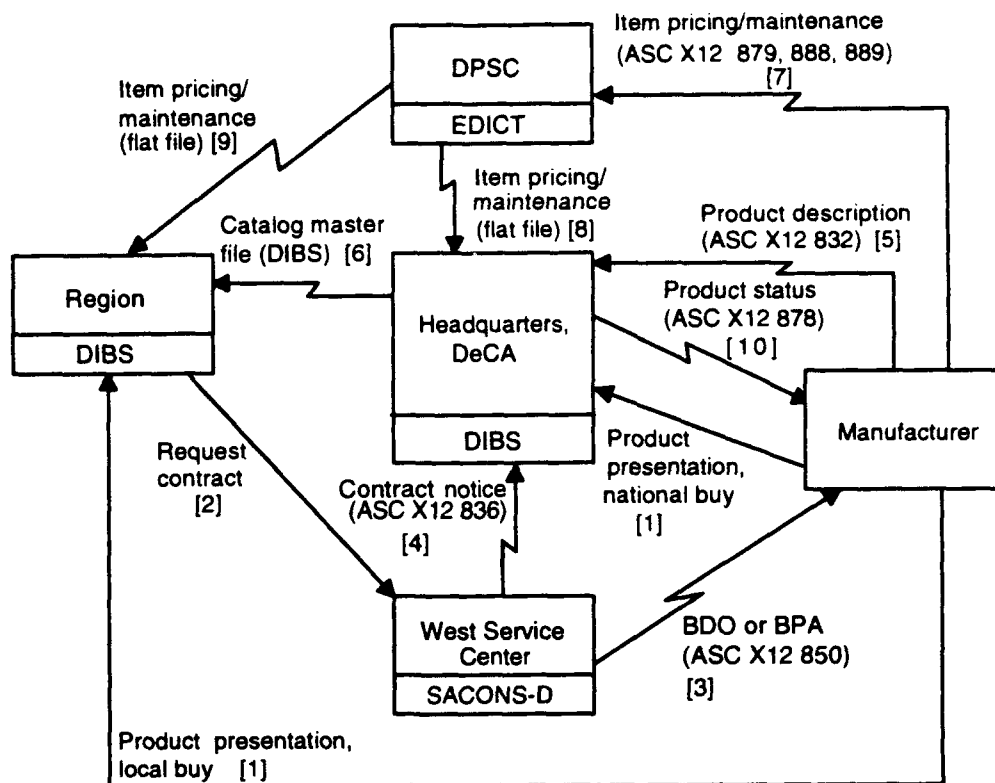
Contracting and Item Pricing/Maintenance

Figure 4-1 shows the electronic process that DeCA could follow to open a new contract for items not on its product list or not offered by DPSC's Subsistence Supply Bulletin. The vendor begins by making a presentation (or "sales pitch") at either a regional office (for a local buy) or Headquarters, DeCA (for a national buy) [1]. If the region decides to add the item or items to its product list, it requests a contract from the West Service Center, usually in writing or electronically [2]. After the West Service Center awards the contract, it transmits either a blanket delivery order (BDO) or a blanket purchase agreement (BPA) to the manufacturer using an ASC X12 Transaction Set 850, *Purchase Order* [3]. The West Service Center then transmits the contract information to Headquarters, DeCA, using an ASC X12 Transaction Set 836, *Notice of Contract Award* [4]. After receiving the Transaction Set 850, the manufacturer sends product description information to Headquarters, DeCA, using an ASC X12 Transaction Set 832, *Furnish or Request Price of Goods or Services* [5]. At Headquarters, DeCA, that information is electronically loaded into DIBS; Headquarters also disseminates the product description information to the seven DeCA regions via the DIBS Catalog Master File [6].

The manufacturer also sends price change information to DPSC using the ASC X12 Transaction Set 879, *Price Change* [7]. ASC X12 Transaction Set 888, *Item Maintenance*, is used for product changes other than price, such as a change in packaging or item size. In addition, the manufacturer uses ASC X12 Transaction Set 889, *Promotion Announcement*, to send promotion announcement information to the regions, while DeCA uses the ASC X12 Transaction Set 878, *Product Authorization/De-Authorization*, to inform the manufacturer of a change in a product's status [10]. Once price information is captured by the Subsistence Supply Bulletin, DPSC electronically transmits the updated bulletin to Headquarters, DeCA, via its EDICT system [8] using the same transaction sets that support the flow of item pricing/maintenance from the manufacturer to DPSC [7]. The supply bulletin is also sent by DPSC to the region in a flat-file format [9].

Ordering and Receiving

As noted above, the ordering and receiving EDI information flows are different for each of DeCA's three largest delivery practices – FDS, DSD, and CDC. The fourth delivery practice, DSD-S, a manual process, accounts for less than 1 percent of DeCA line items, so we will not present an information flow for DSD-S.



Note: For BPAs, item pricing/maintenance transactions flow from the manufacturer directly to DeCA.

Figure 4-1.
Contracting and Item Pricing/Maintenance

FREQUENT DELIVERY SYSTEM

Figure 4-2 shows how DeCA could use EDI to enhance its ordering and receiving of both FDS and CDC items (the same information flows apply to both types of items).

Stores generate orders using hand-held computers. An inventory clerk uses a hand-held computer to scan the UPC for each FDS shelf item at the store and then enters an order amount for each item. When the inventory process is completed, the clerk uploads the information into DIBS, which distributes that information to the regions. That same information is also uploaded into a microcomputer. The microcomputer separates the ordered items based on which distributor carries the items. Flat-file order information is then transmitted to the appropriate distributor [1].

After the distributor processes the order, it sends advance shipment information to the region using ASC X12 Transaction Set 856, *Ship Notice/Manifest* [2]. That information is then also made available to the store [3]. After the ordered

items are delivered [4], the store enters receipt information into DIBS, which forwards it biweekly to the region via DIBS [5]. The region then sends consolidated receiving advice information to the distributor (or CDC) using the 856 Transaction Set [6]. The region also uses DIBS to transmit summary receipt information to SAVES at the Service Center [7]. Finally, the distributor alerts the manufacturer that an order has been filled by sending the manufacturer an ASC X12 Transaction Set 887, *Product Transfer and Resale Report* [8].

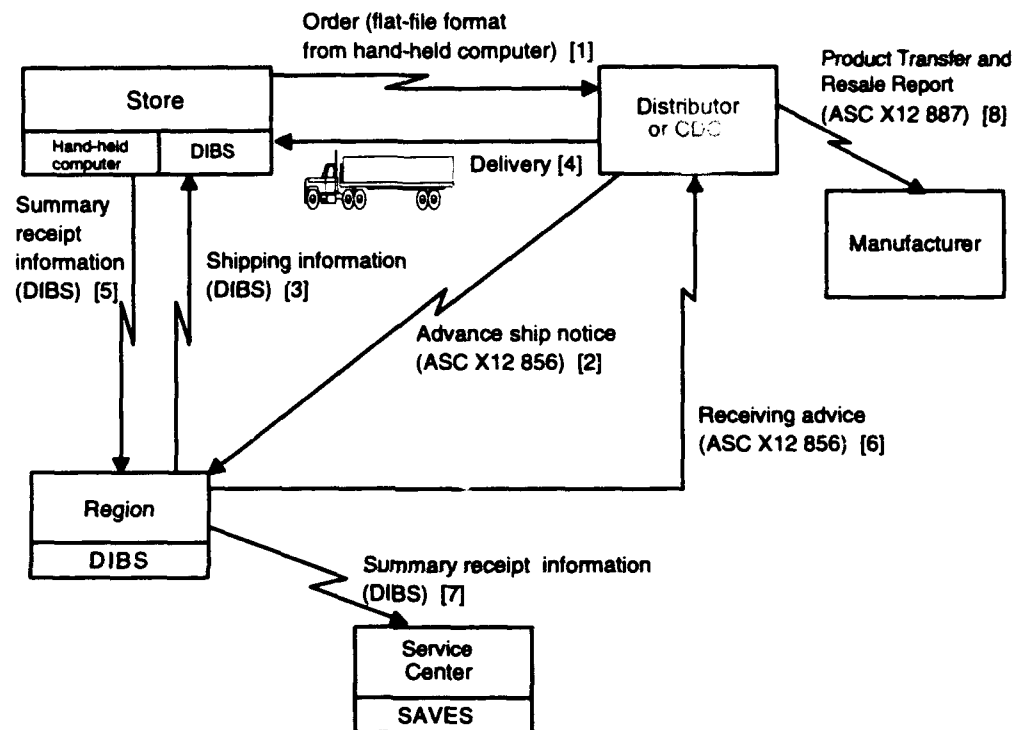


Figure 4-2.
FDS/CDC Ordering and Receiving

CENTRAL DISTRIBUTION CENTERS

The use of EDI in the operation of CDCs needs to accommodate two separate functions: filling orders and receiving. In the first, the store orders items from the CDC, while in the second, the CDC orders items from manufacturers to replenish its own inventory.

Stores order items from CDCs in much the same way that they order items from a distributor under the FDS concept (Figure 4-2). When a store orders from a CDC, however, order file information goes to the region before being passed to the CDC through DIBS. (Under FDS, ordering information is sent directly from the store to the distributor.) The CDC also transfers advance shipment and

receipt information to the region through DIBS, flows [2] and [6] in Figure 4-2, in contrast to the EDI links proposed for FDS operations.

The process of a CDC placing an order with a manufacturer is quite complex, as Figure 4-3 illustrates. After a buyer finalizes an order (a process that generally involves adjusting a DIBS-generated order), the CDC transmits the information to the region (through DIBS) [1]. The region then sends the order to the manufacturer using either UCS Transaction Set 875, *Purchase Order*, or Transaction Set 876, *Purchase Order Change* [2]. The manufacturer sends an advance ship notice to the region using ASC X12 Transaction Set 856, *Ship Notice/Manifest* [3], where the notice becomes available to the buyer and to the CDC via DIBS [4]. Any changes to the delivery on the delivery ticket are entered into DIBS. After delivery [5], the driver returns the delivery ticket (with changes noted) to the manufacturer [6]. The CDC also sends receipt information to the region via DIBS [7]. The region then sends an ASC X12 Transaction Set 856, *Ship Notice/Manifest*, to the manufacturer [8]. It also sends summary receipt information to the Service Center [9], where it is used for invoice reconciliation.

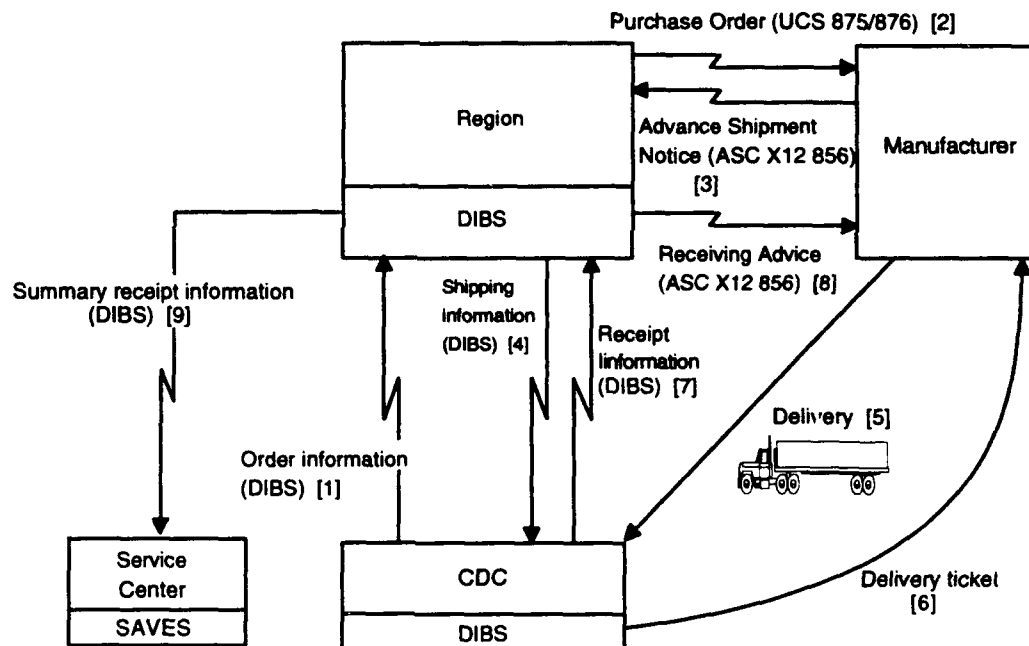


Figure 4-3.
CDC Ordering and Receiving

DIRECT STORE DELIVERY

Unlike CDC and FDS, DeCA stores perform no advance ordering under DSD. Instead, the manufacturer is responsible for product replenishment. DSD is also unique because the store and manufacturer generally exchange ordering and

receiving transaction sets on the receiving dock at the time of delivery to minimize flow of paper.

As Figure 4-4 shows, the manufacturer determines the store's requirements *during delivery* and records delivery information using a hand-held computer [1]. The manufacturer also downloads information from the hand-held computer (specifically, product type and quantity information) at the store using the ASC X12 Transaction Set 894, *Delivery Record* [2]. DIBS then summarizes that information biweekly and transmits it to the region [3] and service center via DIBS [4].

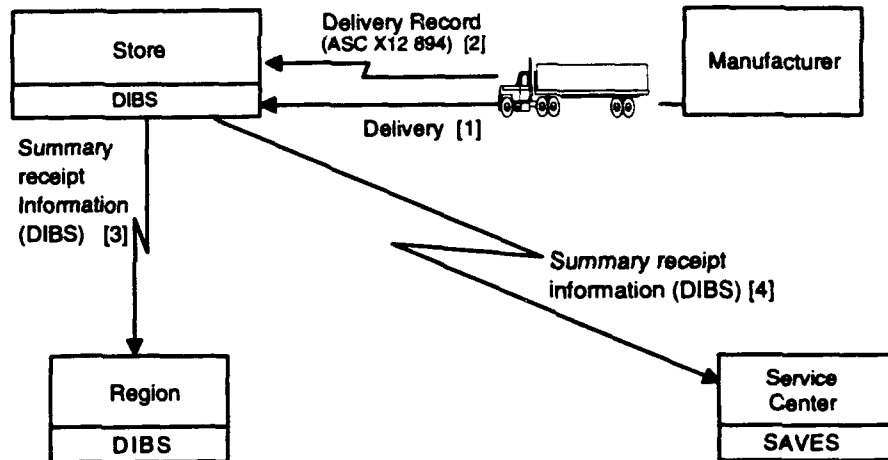


Figure 4-4.
DSD Ordering and Receiving

Invoicing and Payment

The invoicing and payment information flow (Figure 4-5) is the same for all types of delivery. After items are delivered, the stores use the Frequent Delivery System-personal computer (FDS-PC) system of DIBS to summarize receipt information and send it to the region [1]. DIBS then uses an interface program to transfer summary receipt information to SAVES at the service center [2].

After product delivery, the manufacturer sends an ASC X12 Transaction Set 810, *Invoice*, to a service center for payment [3]. (Note: Manufacturers will send invoices directly to DFAS-CO when DeCA relinquishes the invoice reconciliation function.) The service center then uses SAVES to match the receipt and invoice information as part of the invoice reconciliation process. If it does not encounter any problems, the service center transmits a voucher file (via SAVES) to DFAS-CO [4], where it is used to make a disbursement. If the service center finds a problem (e.g., the manufacturer has charged the wrong price), it must contact either the store or the manufacturer for further information. (Implementing EDI in ordering, receiving, and item pricing/maintenance may eliminate

many of these reconciliation problems.) DFAS-CO then generates an electronic payment using the ASC X12 Transaction Set 820, *Payment Order/Remittance Advice*, and sends the payment to its bank [5]. If the manufacturer and DFAS-CO do not use the same bank, then DFAS-CO's bank transmits that same information to the manufacturer's bank [6]. Finally, DFAS-CO sends an ASC X12 Transaction Set 820 containing remittance advice information to the manufacturer [7]. If DeCA and DFAS-CO use the NACHA formats (CCD+ and CTX) for electronic payments, the manufacturer's bank, not DFAS-CO, sends the remittance advice [8].

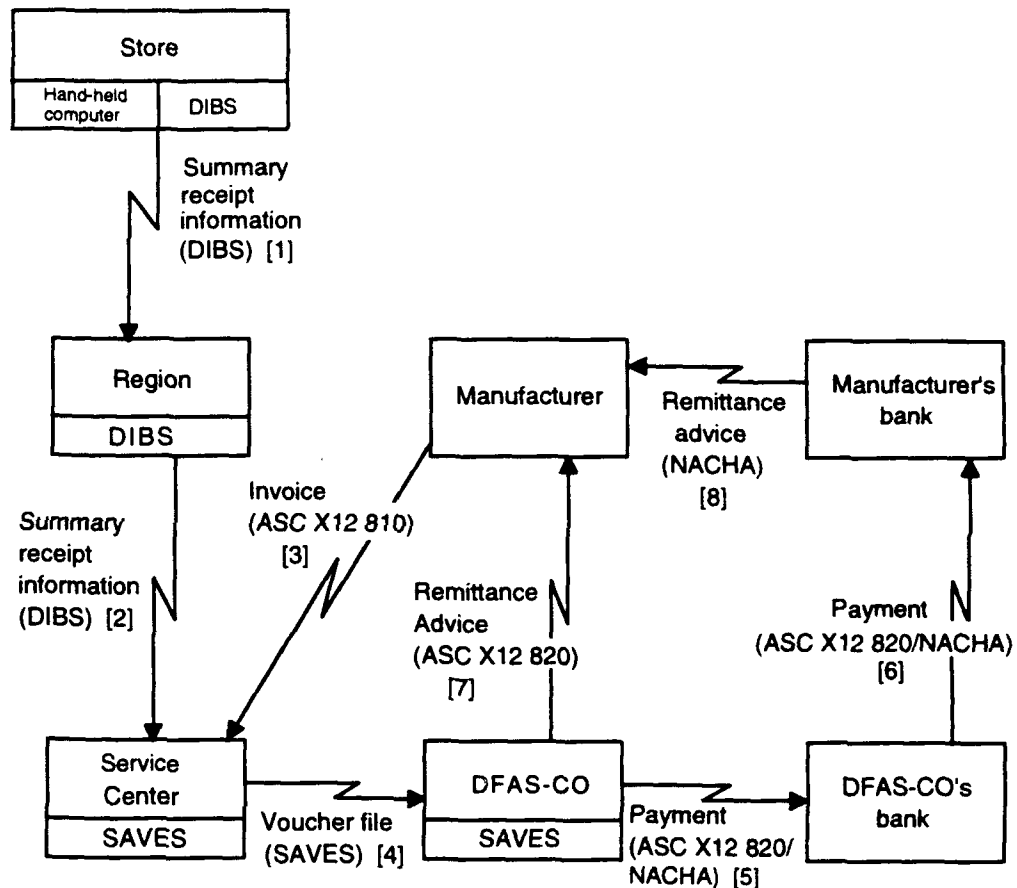


Figure 4-5.
Invoicing and Payment

The information flow changes slightly for invoicing if DeCA uses DTL, as discussed in Chapter 3. With DTL, reconciliation of the delivery ticket takes place at the loading dock at the time of delivery. Receipt data would continue to flow to the service center for payment [1] and [2], but the invoice transmission [3] would be eliminated. All other processes pertaining to payment, steps [4] through [8], would remain unchanged.

Under evaluated receipt settlement, the information flow would be the same as described for DTI except that receipt information would be received electronically at the store. In Figure 4-5, this would appear as a separate flow, occurring prior to [1].

TECHNICAL CONFIGURATION

This section provides an overview of the technical configuration (i.e., hardware, software, and communications linkages) to support our proposed EDI information flows. The technical configuration consists of two architectures: one long range and the other interim. The long-range architecture, as proposed by the EDI Executive Agent, satisfies the DMRD 941 goal of a standard EDI architecture throughout the DoD. Nevertheless, the technology to support that architecture is still under development. In contrast, the interim architecture relies on existing EDI technology and can be implemented immediately. Further, the interim architecture is compatible with the long-range architecture, which will enable DeCA to migrate its interim EDI configuration to the DoD's long-range architecture when it becomes available.

Figure 4-6 illustrates DeCA's long-range architecture. The specific components of this architecture are described in more detail below.

EDI Value-Added Network

Although DoD activities could establish direct communications with their external trading partners using modems and commercial telephone lines, the DoD has chosen to use EDI VANs to communicate with these trading partners. The VANs provide a number of services that simplify EDI communications, such as document handling and distribution (electronic mailboxing); protocol and speed conversion; network interconnectivity; data backup; and customer support. Without VANs, DoD activities would need to negotiate individually with each trading partner to establish compatible communications protocols, schedule daily information transfers, and arrange backup procedures if electronic communications fail. From a practical point of view, such an arrangement would be an operational nightmare. However, it may still be desirable to establish a direct link in specific instances when dealing with high-volume trading partners.

This architecture assumes that most external trading partners would transact their business with DeCA using commercial VANs. However, DeCA should explore the advisability of direct connections with some of its high-volume trading partners.

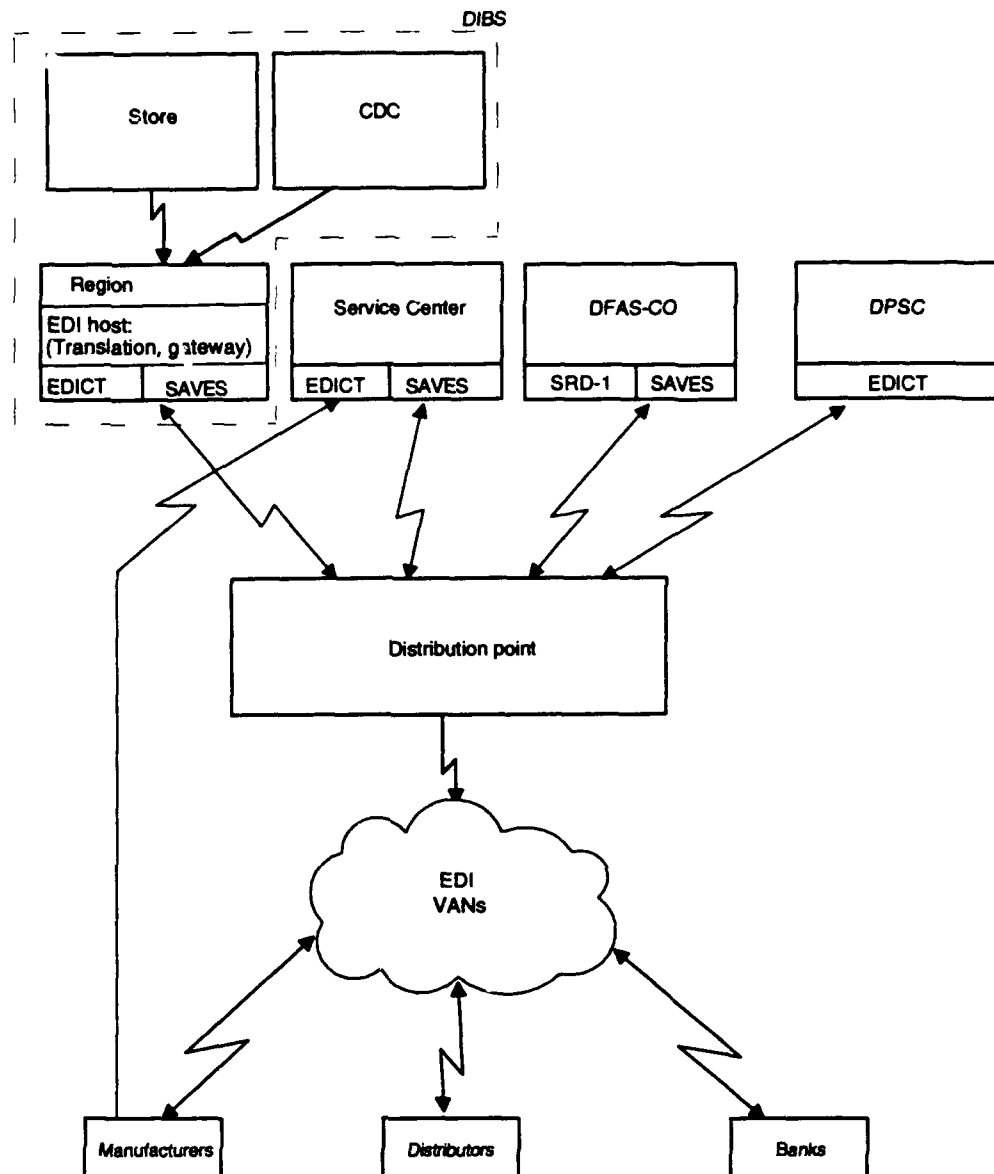


Figure 4-6.
DoD's Long-Range EDI Architecture

EDI Host

The EDI host, most likely a dedicated 486 microcomputer or a UNIX-based minicomputer, forms the core of DeCA's EDI system and should be installed at Headquarters, DeCA, and perhaps at each of the region headquarters in the future. (The number of transactions may require that each region operate its own EDI host rather than being served from a single, DeCA-wide host. Use of a multi-user UNIX machine, however, could provide for additional utilization of the host

machine.) The two major components of the host are the gateway and EDI translation software.

GATEWAY SOFTWARE

The Defense Logistics Agency (DLA) Systems Automation Center (DSAC) has developed INX as an interface program to standardize EDI exchanges between the DoD and its commercial trading partners. INX acts as an intelligent gateway processor because it routes EDI transactions to the appropriate data base. It also contains a number of useful utilities, such as archiving for storage and retrieval of EDI information, status tracking, performance management, and directory maintenance.

Both DPSC and DFAS-CO are using INX for EDI applications. DeCA should install INX initially on the EDI host at the East Service Center. Eventually, when DeCA has implemented EDI in its ordering and receiving functions, it should also install INX at each of the seven regions.

EDI TRANSLATION SOFTWARE

Electronic data interchange translation software enables DeCA to communicate with all of its trading partners in a standard format without changing internal applications. That software is commercially available for virtually all major computer hardware and operating systems.² We expect that this software would reside on the EDI host (a dedicated 486 microcomputer or UNIX minicomputer) like INX.

The INX interface program, which currently operates on an AT&T 3B2 minicomputer, uses an American Business Computer (ABC) translation software package that costs approximately \$15,000 per copy. Several vendors supply translation software for both microcomputer and UNIX environments. The costs of that software vary but generally range between \$5,000 and \$10,000 for microcomputers to between \$15,000 and \$20,000 for UNIX versions.

Distribution Point

The EDI Executive Agent is considering the development of distribution points to provide a common communications interface between the DoD and its commercial trading partners. Each distribution point would cover a specific geographical region. Communications between DoD activities and a distribution point would occur through the Defense Information Systems Network (DISN). The distribution point would also assist DoD activities in document handling, data backup, and customer support. Under an arrangement currently being considered by the EDI Executive Agent, DoD activities would not pay transmission

²For more information on EDI translation software, see LMI Report PL205RD1, *A Guide to EDI Translation Software, 1992 Edition*, Harold Frohman.

costs on any transactions sent to or received from their commercial trading partners. In order to do business with the DoD, a commercial trading partner would negotiate the fixed and variable fees for sending and receiving DoD transactions. Under this arrangement, the VANs would also be responsible for providing EDI translation services (at a fee) to all trading partners without such a capability.

Interim Architecture

As noted in Chapter 2, DeCA has successfully tested an EDI invoicing program and is poised to begin implementation. Until the EDI Executive Agent develops, tests, and fields the distribution points, DeCA's EDI program will require an interim architecture. We propose such an architecture in Figure 4-7.

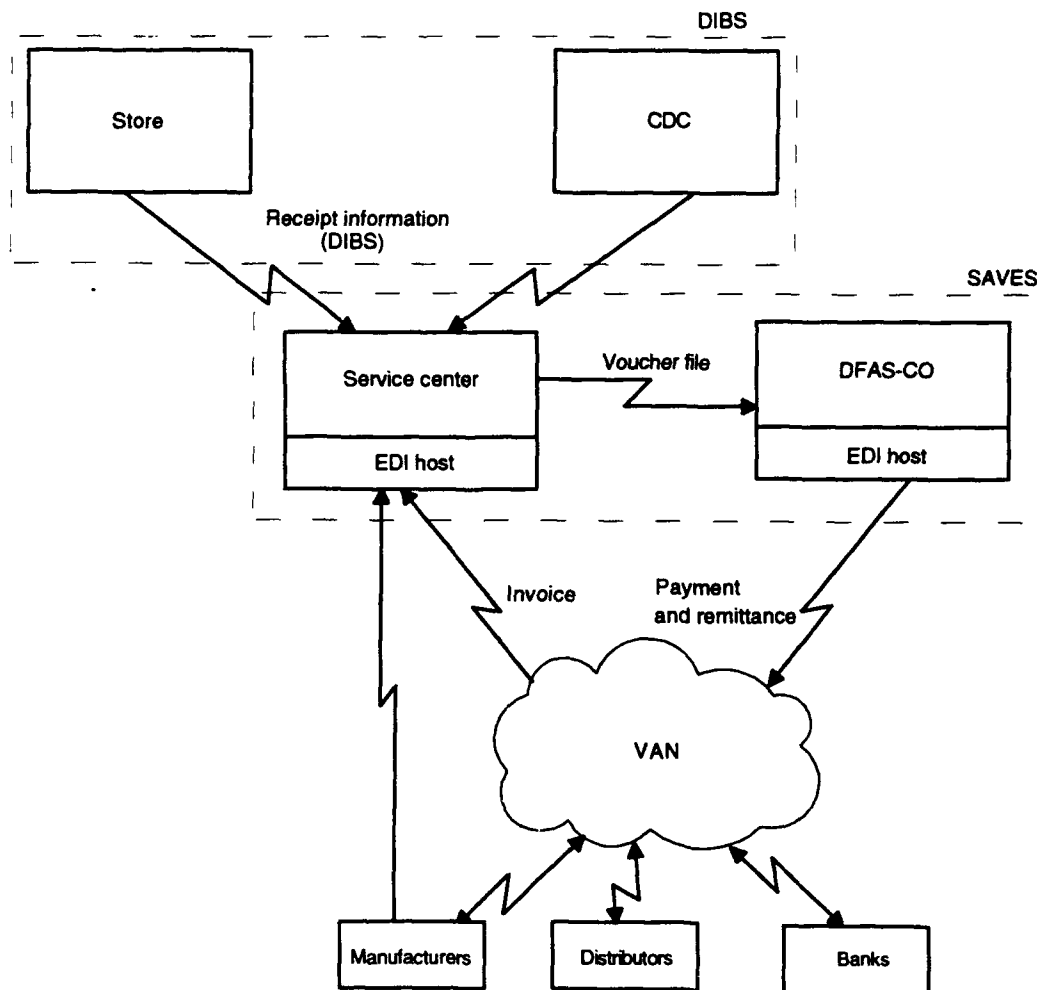


Figure 4-7.
DeCA's Interim EDI Architecture

The interim architecture applies to the invoicing and payment areas only. It assumes that DeCA will field a single EDI host at the East Service Center to receive invoices from manufacturers. After DeCA reconciles an invoice (which includes matching the invoice and receipt information received from the stores and CDCs via DIBS), it transfers the voucher file to DFAS-CO via SAVES. In turn, DFAS-CO sends all payment and remittance advice (again through the VAN) to both the manufacturer and its bank.

SUMMARY

This chapter proposes operating concepts to support implementation of six EDI opportunities at DeCA. The operating concepts consist of information flows and a technical configuration, drawing extensively on existing DeCA systems to support information flows between activities. In the next chapter, we examine the economic effects of DeCA implementing these operating concepts.

CHAPTER 5

Economic Analysis

This chapter presents our estimates of the economic consequences if DeCA implements EDI in the six opportunity areas described in Chapters 3 and 4. We begin by discussing the expected direct and indirect savings from implementing EDI and then address the investment and operating costs required to achieve those savings. We conclude with suggestions on which EDI opportunities DeCA should pursue first. Appendix C provides additional detail on our savings and costs calculations.

DIRECT SAVINGS

In Chapter 1, we defined EDI as the exchange of information between computer applications systems. EDI usually enables an organization to significantly reduce labor costs by eliminating most of the manual steps required to process paper documents. We refer to those reductions as direct savings.

Table 5-1 lists the direct cost savings per document that DeCA can expect from implementing EDI in each of its key functional areas. (Appendix C presents the work flows and worksheets used to calculate these savings.) The savings range from a high of \$6.42 for each new contract processed with EDI to \$0.00 for FDS and CDC orders. The table also includes an estimate of the annual volume of each document. Table 5-1 shows that the use of EDI can save DeCA more than \$61 million (in constant 1993 dollars) in direct savings over a 10-year period (excluding approximately \$2.5 million in investment costs and nearly \$4.5 million in total operating costs, as shown subsequently in Tables 5-3 and 5-4, respectively).

Table 5-2 shows the annual projected direct cost savings for each of the functional areas through FY02. We expect these savings to peak in FY02 at approximately \$9.9 million. More than 88 percent of those savings (\$8.8 million) should occur in two areas: invoice and payment. Implementing EDI in the receiving function is also expected to generate significant savings — approximately \$700,000 annually (7 percent of the total) at its peak. Substantially smaller savings are expected for item pricing and item maintenance.

The DeCA can expect little or no direct cost savings from implementing EDI in the contracting and ordering areas. In contracting, the annual document volumes are small (DeCA creates approximately 3,000 resale and 3,000 nonresale contracts, and performs 25,000 contract modifications). In the ordering area, DeCA can expect little additional direct savings because the placing of FDS and CDC orders (using hand-held computers) is already automated. Nevertheless,

that ordering information is currently exchanged using proprietary formats. Although direct cost savings are difficult to measure in the ordering area, we believe that DeCA would still benefit by using either standard UCS or ASC X12 transaction sets to transmit order information.

Table 5-1.
EDI Savings Summary

| Functional area | Document or transaction | Annual volume (000) | Cost savings/document (\$) | 10-year life-cycle savings (\$000) |
|------------------------|----------------------------------|---------------------|----------------------------|------------------------------------|
| Invoice | Commercial invoice | 2,700 | 3.19 | 49,697 |
| Payment | Voucher stub and check | 1,800 | 0.69 | 7,168 |
| Item pricing | Price quote sheet | 288 | 0.25 | 350 |
| Item maintenance | Price quote sheet | 360 | 0.34 | 596 |
| Order | Electronic (hand-held computers) | 13,375 | 0 | 0 |
| Receipt | Commercial delivery ticket | 2,700 | 0.33 | 3,554 |
| New contracts | SF 26/DD Form 1155 | 6 | 6.42 | 121 |
| Contract modifications | SF 26/DD Form 1155 | 25 | 5.97 | 469 |
| Total | — | 21,254 | — | 61,955 |

In developing the estimates in Table 5-2, we made the following assumptions:

- ◆ *Operating concepts.* We assume that DeCA will adopt the EDI information flows and technical architectures presented in Chapter 4. However, DeCA will not eliminate all manual processing if it adopts those operating concepts. For example, electronic invoicing by itself will not solve the problems that occur when manufacturers submit incorrect prices on invoices, although those problems could be relatively minor when DeCA receives unit price information electronically. Business processes that require judgment, interpretation, and direct communication (such as processing returned items and resolving disputes over being billed for goods not received or for shortages) also will not be enhanced through EDI.
- ◆ *Implementation priorities and phases.* Our implementation plan assumes that DeCA will consolidate related EDI efforts and implement them in the following sequence: invoicing and payment, item pricing/maintenance, ordering and receiving, and contracting. Because invoicing and payment account for nearly 90 percent of the life-cycle savings, DeCA should assign top priority to implementing EDI in those areas. Although the savings are relatively small in the item pricing/maintenance areas, we believe that they should

constitute DeCA's second priority because the use of EDI in those areas should help to reduce errors that currently occur in the receiving, invoicing, and payment areas. Contracting, the most complicated application with a very small payback, should be saved for last. We estimate that each phase in the sequence will require approximately 1 year of development and testing before DeCA can implement a production system.

- ◆ *Trading partner expansion.* We assume that DeCA will initially target its highest volume manufacturers when implementing EDI. The implementation plan we propose in Chapter 6 focuses on DeCA establishing an EDI relationship with its top 700 manufacturers, primarily because they generate 90 percent of the invoices and 92 percent of the invoice dollar. During implementation, we assume that DeCA will bring manufacturers into the program at a rate of 30 each of the first 2 years, 60 the third year, 80 the fourth year, and 100 a year in the fifth year and beyond.

Table 5-2.
Direct Cost Savings from EDI

| Functional area | Savings (\$000) | | | | | | | | | | |
|------------------------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | FY93 | FY94 | FY95 | FY96 | FY97 | FY98 | FY99 | FY00 | FY01 | FY02 | Total |
| Invoice | 431 | 1,723 | 2,584 | 3,876 | 5,254 | 6,287 | 6,890 | 7,321 | 7,579 | 7,752 | 49,697 |
| Payment | 62 | 248 | 373 | 559 | 758 | 907 | 994 | 1,056 | 1,093 | 1,118 | 7,168 |
| Item pricing | 0 | 4 | 14 | 22 | 32 | 44 | 52 | 58 | 61 | 63 | 350 |
| Item maintenance | 0 | 6 | 24 | 37 | 55 | 75 | 89 | 98 | 104 | 108 | 596 |
| Order | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Receipt | 0 | 0 | 44 | 178 | 267 | 401 | 544 | 650 | 713 | 757 | 3,554 |
| New contracts | 0 | 0 | 0 | 2 | 8 | 12 | 17 | 23 | 28 | 31 | 121 |
| Contract modifications | 0 | 0 | 0 | 8 | 30 | 45 | 67 | 91 | 109 | 119 | 469 |
| Total | 493 | 1,981 | 3,039 | 4,682 | 6,404 | 7,771 | 8,653 | 9,297 | 9,687 | 9,948 | 61,955 |

INDIRECT SAVINGS

Although the direct cost savings possible through EDI are large, DeCA can obtain even larger savings if it also changes some of its business practices. For example, expanding the use of DTI and sharing POS information with manufacturers and distributors could reduce DeCA's ordering and inventory costs significantly. Many private-sector firms have found that for every dollar in direct cost savings generated by EDI, they can save another \$3 to \$5 in indirect savings.

Those types of savings are usually obtained by making significant modifications to applications systems and business procedures.

To illustrate the nature of indirect cost savings, consider the following example. By exchanging POS data with manufacturers and implementing a "continuous replenishment" inventory system, DeCA should be able to significantly reduce its CDC inventories, perhaps even eliminating the need for some CDCs. Further, some manufacturers report that POS data allow them to improve their production, planning, and inventory processes, which can lead to elimination of product promotions and the establishment of low everyday prices. Those same benefits should also be available to DeCA.

In addition, because DTI allows DeCA to reconcile the invoice at the time of delivery (when errors are easy to correct), it should also reduce DeCA's late interest payments by reducing the amount of time required to correct errors.

INVESTMENT COSTS

Table 5-3 shows that by implementing EDI in six regions (not including the European region, which is the subject of a separate study), DeCA will need to make a one-time investment of approximately \$2.5 million. We base this estimate on the following:

- ◆ *Hardware.* Each region will require one dedicated minicomputer to serve as the EDI host. (We assume that DeCA stores already have sufficient hardware to process EDI transactions.)
- ◆ *Translation software.* Each region will require a translation software package, at a cost of approximately \$15,000 per package.
- ◆ *System integration.* Many private-sector companies consider system integration as the most costly category in a typical EDI implementation. We assume that DFAS-CO will use the INX system for gateway and translation services. Barring any unusual requirements, we estimate that installing and customizing INX will cost approximately \$100,000 for the first DeCA region and \$20,000 for each additional region. Further, based upon the experience of many private-sector firms, we estimate that DeCA may need to invest approximately \$500,000 to modify its applications systems (DCIS, DIBS, and SAVES) to accept and process EDI transactions.
- ◆ *Program management.* We assume that DeCA staff members will perform all program management tasks such as promoting and coordinating the program, revising and refining DeCA operating procedures, and soliciting trading partners. We estimate that these tasks will cost approximately \$270,000 for the first 2 years of the program. Then, we assume that a full-time EDI program office will take over the tasks of managing the remaining development efforts.

- ◆ *Implementation support.* This category of investment costs includes such activities as coordination and general support; standards development and modifications (including the development of implementation conventions); training; and trading partner expansion. Because some of these activities require specialized skills (particularly training and implementation conventions), many Defense agencies use contractors to perform them. For cost estimation purposes, we assume that DeCA will use contractors to perform them at a cost of approximately of \$1.2 million. These implementation costs may also be spread over a 2- or 3-year period.

Table 5-3.
EDI Investment Costs - All DeCA Regions

| Category | Requirement | Investment (\$000) |
|-------------------------------------|---|--------------------|
| Hardware | One minicomputer for each CONUS region, \$50,000 each | 300 |
| Translation software | One ABC package per region, \$15,000 each | 90 |
| System integration | | |
| -INX/ABC installation | \$100,000 for first region; \$20,000 each additional region | 200 |
| -DIBS/DCIS/SAVES modifications | Quick response; evaluated receipts; EDICT data elements | 500 |
| Program management | | |
| -Promote/coordinate | Two full-time employees, both GS-12, \$54,000 per year each | 108 |
| -Revise/refine operating procedures | One full-time employee, GS-12, \$54,000 per year | 58 |
| -Trading partner development | Two full-time employees, both GS-12, \$54,000 per year each | 108 |
| Implementation support | | |
| -Coordination/general support | Three contractor man-years | 540 |
| -Standard development/modifications | 1.5 contractor man-years | 270 |
| -Training | \$10,000 for each region | 60 |
| -Trading partner expansion | 1.5 contractor man-years | 270 |
| Total | | 2,504 |

Note: GS = General Schedule.

OPERATING COSTS

Although EDI will significantly reduce most of DeCA's direct labor costs, we expect that some operating expenses will increase as a result of EDI, including the following (see Table 5-4):

- ◆ *Telecommunications.* DeCA's telecommunications costs should increase by more than \$400,000 per year at the program's peak. We base this estimate upon a cost of \$0.05 to transmit small documents (payments, invoices, receipts), \$0.10 for medium-sized documents, and \$0.15 for large documents (item pricing, item maintenance, contracts, and contract maintenance).¹
- ◆ *Staffing.* We recommend that DeCA create, beginning in FY94, an EDI program office to manage its implementation efforts. The program office should be responsible for the following activities:
 - ▶ Trading partner administration
 - ◆ Negotiating and maintaining trading partner agreements and addendums with commercial trading partners
 - ◆ Negotiating and maintaining interface requirements agreements with DoD trading partners
 - ▶ Standards/conventions development and maintenance
 - ◆ Attending ASC X12 and UCS committee meetings
 - ◆ Developing and maintaining implementation conventions
 - ◆ Implementing transaction set version and release controls
 - ▶ Technical support
 - ◆ Developing EDI training programs
 - ◆ Resolving EDI legal and security issues
 - ◆ Performing functional integration with both DeCA and other DoD systems
 - ◆ Resolving software and communications issues

¹See LMI Report PL005TR1, *EDI Telecommunications Strategy for Defense Transportation*, Harold L. Frohman, Bruce J. Kaplan, William R. Ledder, April 1990.

- Program promotion
 - Serving as an EDI clearinghouse
 - Sponsoring commercial and DoD EDI workshops.
- ◆ *Software maintenance.* Most translation software vendors provide maintenance support that includes software updates, correction of software bugs, and telephone support. Yearly software maintenance charges are generally priced 15 percent of the cost of the translation software, which we have spread over the 10-year life cycle of the program.
- ◆ *EDI mailbox.* We assume that DeCA will require a single VAN mailbox with a \$65 monthly mailbox charge.

Overall, we estimate that by implementing EDI, DeCA will incur an additional \$4.5 million in operating costs over 10 years, with a peak of approximately \$645,000 annually.

Table 5-4.
EDI Operating Costs

| Area | Costs (\$000) | | | | | | | | | | |
|----------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| | FY93 | FY94 | FY95 | FY96 | FY97 | FY98 | FY99 | FY00 | FY01 | FY02 | Total |
| Telecommunications | 11.0 | 50.0 | 94.0 | 158.0 | 222.0 | 286.0 | 335.0 | 370.0 | 392.0 | 406.0 | 2,324.0 |
| Staffing | 0.0 | 218.0 | 218.0 | 218.0 | 218.0 | 218.0 | 218.0 | 218.0 | 218.0 | 218.0 | 1,962.0 |
| Software maintenance | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 200.0 |
| EDI mailbox | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 8.0 |
| Total | 31.8 | 288.8 | 332.8 | 396.8 | 460.8 | 524.8 | 573.8 | 608.8 | 630.8 | 644.8 | 4,494.0 |

SUMMARY

We estimate that DeCA should be able to save nearly \$55 million over a 10-year period through the implementation of EDI in the following sequence: invoicing and payment, item pricing/maintenance, ordering and receiving, and contracting. To achieve those savings, however, DeCA will need to make a one-time investment of \$2.5 million. Table 5-5 summarizes the net savings.

Table 5-5.
Net Savings

| Area | Costs (\$000) | | | | | | | | | | |
|---------------------|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| | FY93 | FY94 | FY95 | FY96 | FY97 | FY98 | FY99 | FY00 | FY01 | FY02 | Total |
| Direct cost savings | 493.0 | 1,981.0 | 3,039.0 | 4,682.0 | 6,404.0 | 7,771.0 | 8,653.0 | 9,297.0 | 9,687.0 | 9,948.0 | 61,955.0 |
| Investment costs | 504.0 | 1,000.0 | 1,000.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2,504.0 |
| Operating costs | 31.8 | 288.8 | 332.8 | 396.8 | 460.8 | 524.8 | 573.8 | 608.8 | 630.8 | 644.8 | 4,494.0 |
| Total | (42.8) | 692.2 | 1,706.2 | 4,285.2 | 5,943.2 | 7,246.2 | 8,079.2 | 8,688.2 | 9,056.2 | 9,303.2 | 54,957.0 |

In the following chapter, we present a detailed EDI implementation plan and schedule to guide DeCA's EDI program.

CHAPTER 6

Implementation Strategy

This chapter identifies the tasks that DeCA needs to undertake to implement an EDI program. It also proposes a schedule for carrying out that implementation.

IMPLEMENTATION PLAN

Table 6-1 lists the tasks that typically are associated with implementing a comprehensive EDI program. We describe each of those tasks in more detail below.

Table 6-1.
EDI Implementation Plan

- | | |
|------|---|
| 1.0 | Establish EDI project team |
| 2.0 | Specify functional requirements |
| 2.1 | Refine operating concepts |
| 2.2 | Identify data requirements |
| 2.3 | Publish implementation conventions |
| 2.4 | Identify applications systems modifications |
| 2.5 | Determine EDI translation software requirements |
| 3.0 | Identify physical requirements |
| 3.1 | Develop hardware specifications |
| 3.2 | Establish telecommunications requirements and strategy |
| 3.3 | Procure hardware, translation software, and telecommunications services |
| 4.0 | Perform security assessment |
| 5.0 | Establish trading partner relationships |
| 5.1 | Develop information package |
| 5.2 | Develop trading partner agreement |
| 5.3 | Develop marketing strategy |
| 5.4 | Sponsor vendor conferences |
| 6.0 | Modify applications systems |
| 7.0 | Develop/install interface software |
| 8.0 | Modify business practices and operating procedures |
| 9.0 | Integrate and test system |
| 10.0 | Train system operators |
| 11.0 | Implement production system |
| 12.0 | Expand trading partner base |

1.0 Establish EDI Project Team

The first task is establishing a project team to guide DeCA's EDI implementation efforts. The composition of that team depends on the opportunity areas being implemented. For example, because DFAS-CO now plays a role in DeCA's invoicing and payment missions, it should be represented on the invoicing and payment EDI project team. We recommend that each project team include individuals with systems, functional, and communications expertise. Chaired by a DeCA project manager, each project team should be responsible for implementing the remaining tasks in this plan.

2.0 Specify Functional Requirements

In this task, the project team would identify the data and operational issues that affect DeCA's efforts to implement EDI.

2.1 REFINE OPERATING CONCEPTS

Chapter 4 presents detailed information flows and technical architectures for each EDI opportunity area. The project team should use those information flows and architectures as baselines and refine them as appropriate.

2.2 IDENTIFY DATA REQUIREMENTS

In this subtask, the project team, working with DeCA functional managers, would identify the data requirements needed to accomplish the EDI information flows identified in Chapter 4. Instead of just compiling a list of data elements on existing paper forms, the project team should strive to minimize the number of data elements required in each EDI transmission. That effort should result in lower telecommunications costs by eliminating unnecessary or redundant data.

2.3 PUBLISH IMPLEMENTATION CONVENTIONS

In this subtask, the project team would map the data requirements (developed in subtask 2.2) into the appropriate ASC X12 or UCS transaction sets. (Table 4-1 lists the transaction sets required to implement DeCA's EDI program.) DoD implementation conventions already exist for five of the 17 transaction sets required by DeCA: 810, *Commercial Invoice*; 820, *Payment Order/Remittance Advice*; 824, *Applications Advice*; 856, *Ship Notice/Manifest*; and 997, *Functional Acknowledgment*. Wherever possible, the team should use those conventions.

2.4 IDENTIFY APPLICATIONS SYSTEMS MODIFICATIONS

Some of DeCA's applications systems (such as DIBS, DCIS, SAVES, and SACONS-D) may require modification to accommodate EDI. For example, DeCA may need to modify data bases, input screens, and reports to accept EDI transmissions and to process and transmit acknowledgment information. In this subtask, the project team would identify those modifications and develop a plan for accomplishing them.

2.5 DETERMINE EDI TRANSLATION SOFTWARE REQUIREMENTS

In this subtask, the project team would determine DeCA's EDI translation software requirements. Those requirements could include translation of internal fixed records to and from ASC X12 standards, unattended communications with the host applications systems, and compatibility with commercial VANs. The project team will find a complete list of translation software requirements in LMI's *A Guide to EDI Translation Software*, 1992 Edition.

3.0 Identify Physical Requirements

After developing DeCA's functional requirements, the project team would identify DeCA's hardware, software, and telecommunications requirements.

3.1 DEVELOP HARDWARE SPECIFICATIONS

In this subtask, the project team would assess DeCA's system-throughput requirements for determining DeCA's hardware specifications. A minicomputer platform (like the RISC RS-6000 used in the calculation of investment costs in Chapter 5) should be sufficient for implementing EDI in the invoicing and payment areas. The project team may need to re-examine DeCA's hardware requirements later in the program, particularly when it begins to transmit ordering and receiving information electronically.

3.2 ESTABLISH TELECOMMUNICATIONS REQUIREMENTS AND STRATEGY

In this subtask, the project team would develop a strategy for DeCA to exchange business information electronically with its internal (i.e., DoD) and external (commercial) trading partners. Before completing this strategy, the project team needs to determine DeCA's telecommunications requirements (i.e., the number of potential transactions with its internal and external trading partners). As discussed in Chapter 4, we propose that DeCA use a commercial VAN for most of its EDI transactions with commercial trading partners, although other solutions (such as direct links with large-volume trading partners) should also be explored. However, when DeCA begins to exchange EDI information with DFAS-CO and DPSC, it may want to adopt a more sophisticated

telecommunications strategy (possibly one that involves the DISN and regional distribution points, as proposed by the EDI Executive Agent).

3.3 PROCURE HARDWARE, TRANSLATION SOFTWARE, AND TELECOMMUNICATIONS SERVICES

In this subtask, the project team would procure the needed hardware, translation software, and telecommunications services. Because these types of procurement actions often require a long lead time, the project team should use existing government contracts wherever possible.

4.0 Perform Security Assessment

The Computer Security Act of 1987 requires Federal agencies to identify those computer systems that contain sensitive data and to develop security plans "commensurate with the risk and magnitude of the harm resulting from the loss, misuse, or unauthorized access to or modification of the information contained in such system[s]." The act assigns responsibility for implementing its requirements to the National Institute of Standards and Technology. The EDI Executive Agent is currently developing a security-risk-assessment methodology that DoD activities can use to determine their EDI security requirements. DeCA's EDI project team should use that methodology to perform its security assessment.¹

5.0 Establish Trading Partner Relationships

This task also requires a long lead time. It consists of four subtasks.

5.1 DEVELOP INFORMATION PACKAGE

In this subtask, the project team would develop a marketing brochure that describes DeCA's EDI program, details the procedures for sending electronic transmissions to DeCA, lists DeCA's implementation conventions, and describes how potential trading partners can obtain copies of those conventions. It should also include a trading partner agreement or appropriate registration procedures. DeCA should distribute that brochure to its key trading partners early in the implementation effort.

5.2 DEVELOP TRADING PARTNER AGREEMENT

Trading Partner Agreements (TPAs) specify the conditions under which DeCA and its manufacturers will exchange electronic information. Oftentimes, an addendum is added to the TPA to register manufacturers and exchange key

¹See LMI Report DL203R3, *Risk Assessment Methodology for EDI Unclassified/Sensitive Information Systems*, Julie A. Smith, May 1993.

information (points of contact, passwords, etc.). (Although DFAS-CO has developed a TPA that could be used by DeCA, some modifications may be required.) We recommend that DeCA include a copy of its TPA in the marketing brochure developed in subtask 5.1.

5.3 DEVELOP MARKETING STRATEGY

After developing the information package, the project team would develop a strategy for expanding manufacturer participation in the program. DeCA should focus its EDI efforts on the 700 largest manufacturers (which represent 90 percent of its invoice transaction volume and 92 percent of its dollar volume). Other factors that might influence DeCA's solicitation strategy include the EDI capability, experience, and commitment of its trading partners.

5.4 SPONSOR VENDOR CONFERENCES

In this subtask, the EDI project team would sponsor several conferences to educate manufacturers about DeCA's EDI program and to explain the procedures for participating in the program.

6.0 Modify Applications Systems

In this task, the project team would ensure that the applications enhancements developed as part of subtask 2.4 are implemented in a timely and coordinated fashion. These enhancements should be coordinated with redesign efforts, either under way or planned, for DeCA's applications systems (particularly the DCIS design project).

7.0 Develop/Install Interface Software

In this task, the project team would create and install interface programs that format and pass data between an applications system and the EDI translation software. For cost estimation purposes, we assume that DeCA would use INX as its interface software. Current plans call for installing INX first at Ft. Lee for invoicing and payment and later in the regions when DeCA implements EDI for ordering, receiving, and contract maintenance. DSAC may need to customize INX to fit the particular requirements of each new location. (In Table 5-3, we assumed that DeCA would incur a cost of \$100,000 to install INX at Ft. Lee and \$20,000 to install it at each of the remaining regions.)

8.0 Modify Business Practices and Operating Procedures

In Chapter 4, we suggested several business practice changes (such as use of POS data and DTI) that could significantly enhance the savings DeCA achieves

by using EDI. In this task, the project team would ensure that those changes are coordinated with DeCA's EDI program. Even in the absence of these specific business practice changes, implementing EDI will require the project team to revise DeCA's operating procedures to reflect changes in software operations, transmission scheduling, customer service, and backup routines.

9.0 Integrate and Test System

In this task, the project team would field the EDI system at DeCA, establish telecommunications links, test the system with selected trading partners, and make any necessary system modifications. Testing should be carried out in two phases. First, the project team should test the system internally using sample data, evaluate the results, and make appropriate modifications. In the second phase, the project team should test the system using real data sent by a small group of trading partners through the telecommunications network. The project team should conduct this test in parallel with existing paper flows. Each component of the entire system — telecommunications, translation software, gateway/host processing, interface programs, and applications systems — should be evaluated and modified as appropriate in this phase. Both phases should be repeated until the system passes all pre-established testing criteria.

10.0 Train System Operators

In this task, the project team would formulate and oversee a comprehensive EDI training program that should include training in basic EDI concepts, INX and/or translation software operation, and DeCA's new internal operating procedures.

11.0 Implement Production System

Once it has completed testing, DeCA should be prepared to move into an EDI production environment. It should establish the EDI program management office described in Chapter 5 and implement the trading partner marketing and solicitation strategy developed in Task 5.0.

12.0 Expand Trading Partner Base

After implementing its EDI system with a small number of trading partners (probably no more than 10), DeCA's main challenge will be to expand the trading partner base as quickly as possible. That expansion, which will likely take several years, should be the primary focus of DeCA's program management office. The marketing strategy developed by DeCA in subtask 5.3 should serve as a blueprint for expanding the trading partner base.

IMPLEMENTATION SCHEDULE

Figure 6-1 shows a proposed schedule for implementing EDI at DeCA over a 10-year period. If it adheres to this schedule, DeCA should have a comprehensive EDI production system for its key functional areas by the end of FY96. In constructing this schedule, we assume:

- ◆ DeCA's EDI program will be implemented in the following order: invoicing and payment, item pricing/maintenance, ordering and receiving, and contracting.
- ◆ Each phase of the program will require approximately 1 year of development time before a production system can be implemented. During development, five trading partners will enroll in the DeCA EDI program
- ◆ After implementing the production system, DeCA will expand its trading partner base at the following rate (see numbers in parentheses in Figure 6-1):
 - ▶ 25 trading partners in the first year
 - ▶ 30 trading partners in the second year
 - ▶ 60 trading partners in the third year
 - ▶ 80 trading partners in the fourth year
 - ▶ 100 trading partners in the fifth and each subsequent year.

SUMMARY

By following the implementation strategy laid out in this chapter, we believe that DeCA can save more than \$57 million over a 10-year period for a relatively small investment of approximately \$2.5 million. Further savings are possible if DeCA implements its EDI program in concert with selected business process improvements such as use of POS data and DTI. We estimate that this program should result in DeCA exchanging almost 90 percent of its transactions electronically by the year 2002.

| Functional area | FY93 | FY94 | FY95 | FY96 | FY97 | FY98 | FY99 | FY00 | FY01 | FY02 |
|--------------------------------|-------------|-------------|-------------|-------------------|-------|-------|-------|-------|-------|-------|
| Invoice | <u>(5)*</u> | (30) | (60) | (120) | (200) | (300) | (400) | (500) | (600) | (700) |
| Payment | <u>(5)*</u> | (30) | (60) | (120) | (200) | (300) | (400) | (500) | (600) | (700) |
| Item pricing/ maintenance | | <u>(5)*</u> | (30) | (60) | (120) | (200) | (300) | (400) | (500) | (600) |
| Orders | | | <u>(5)*</u> | (30) | (60) | (120) | (200) | (300) | (400) | (500) |
| Receiving | | | <u>(5)*</u> | (30) | (60) | (120) | (200) | (300) | (400) | (500) |
| Contracts | | | | <u>(5)*</u> | (30) | (60) | (120) | (200) | (300) | (400) |
| Development/testing phase | | | | <u> </u> | | | | | | |
| Expanding trading partner base | | | | <u> </u> | | | | | | |
| Production system | | | | | | | | | | * |

Note: Figures in () = projected number of trading partners at the end of each fiscal year.

Figure 6-1.
Implementation Schedule

APPENDIX A

DeCA Stores

Table A-1 lists the Defense Commissary Agency (DeCA) stores by region and the 1992 sales of each store.

Table A-1.
Commissary Sales in 1992

| Commissary | State/country | Region | 1992 Sales (\$000) |
|-------------------------------|---------------|---------|--------------------|
| Bermuda | Bermuda | Central | 4,419 |
| Chanute Air Force Base (AFB) | IL | Central | 14,288 |
| Cherry Point | NC | Central | 18,865 |
| Crane | IN | Central | 696 |
| C.M. Price | IL | Central | 15,330 |
| Defense General Supply Center | VA | Central | 6,279 |
| Eaker AFB | AR | Central | 6,878 |
| Ft. Benjamin Harrison | IN | Central | 20,336 |
| Ft. Bragg | NC | Central | 59,546 |
| Ft. Campbell | KY | Central | 49,851 |
| Ft. Eustis | VA | Central | 28,357 |
| Ft. Knox | KY | Central | 40,593 |
| Ft. Leavenworth | KS | Central | 26,204 |
| Ft. Lee | VA | Central | 27,761 |
| Ft. Leonard Wood | MO | Central | 28,436 |
| Ft. Monroe | VA | Central | 8,372 |
| Ft. Sheridan | IL | Central | 14,235 |
| Ft. Story | VA | Central | 6,481 |
| Great Lakes | IL | Central | 15,850 |
| Grissom AFB | IN | Central | 11,494 |
| Hadnot Point | NC | Central | 13,384 |
| K.I. Sawyer AFB | MI | Central | 10,115 |
| Langley AFB | VA | Central | 50,353 |
| Lexington | KY | Central | 4,113 |
| Little Creek | VA | Central | 33,753 |
| Little Rock AFB | AR | Central | 34,258 |
| Mallonee Village | NC | Central | 10,458 |
| McCoy | WI | Central | 2,851 |

Source: Interservice, Winter 1993.

| Commissary | State/country | Region | 1992 Sales (\$000) |
|---------------------------------------|---------------|---------|--------------------|
| New River | NC | Central | 4,000 |
| Norfolk | VA | Central | 42,409 |
| Oceana | VA | Central | 43,581 |
| Pope AFB | NC | Central | 2,397 |
| Portsmouth | VA | Central | 17,374 |
| Rock Island | IL | Central | 5,857 |
| Scott AFB | IL | Central | 44,590 |
| Selfridge | MI | Central | 20,246 |
| Seymour Johnson AFB | NC | Central | 19,367 |
| Tarawa Terrace | NC | Central | 16,965 |
| Whiteman AFB | MO | Central | 12,218 |
| Wright-Patterson AFB | OH | Central | 44,829 |
| Wurtsmith AFB | MI | Central | 10,048 |
| Yorktown | VA | Central | 2,165 |
| Subtotal, Central Region (42 stores) | | | 849,602 |
| Altus AFB | OK | Midwest | 11,286 |
| Beeville | TX | Midwest | 1,771 |
| Belle Fourche Air Force Station (AFS) | SD | Midwest | 440 |
| Bergstrom AFB | TX | Midwest | 38,006 |
| Brooks AFB | TX | Midwest | 8,510 |
| Cannon AFB | NM | Midwest | 13,352 |
| Carswell AFB | TX | Midwest | 58,632 |
| Corpus Christi | TX | Midwest | 8,523 |
| Dickinson AFS | ND | Midwest | 310 |
| Dyess | TX | Midwest | 17,704 |
| Ellsworth AFB | SD | Midwest | 18,389 |
| Fitzsimons | CO | Midwest | 11,155 |
| Forsyth AFS | MT | Midwest | 365 |
| Ft. Bliss | TX | Midwest | 57,353 |
| Ft. Carson | CO | Midwest | 40,350 |
| Ft. Hood | TX | Midwest | 58,792 |
| Ft. Hood Sub-Facility | TX | Midwest | 7,270 |
| Ft. Riley | KS | Midwest | 28,315 |
| Ft. Sam Houston | TX | Midwest | 43,630 |
| Ft. Sill | OK | Midwest | 39,156 |
| F. E. Warren AFB | WY | Midwest | 13,396 |
| Goodfellow AFB | TX | Midwest | 10,791 |
| Grand Forks AFB | ND | Midwest | 13,160 |
| Holloman AFB | NM | Midwest | 14,492 |

Source: Interservice, Winter 1993.

| Commissary | State/country | Region | 1992 Sales (\$000) |
|--------------------------------------|----------------------|-----------|--------------------|
| Kelly AFB | TX | Midwest | 8,337 |
| Kingsville NAS | TX | Midwest | 2,245 |
| Kirtland AFB | NM | Midwest | 39,628 |
| Lackland AFB | TX | Midwest | 45,946 |
| LaJunta AFS | CO | Midwest | 575 |
| Laughlin AFB | TX | Midwest | 5,422 |
| Lowry AFB | CO | Midwest | 39,830 |
| McConnell AFB | KS | Midwest | 18,166 |
| Minot AFB | ND | Midwest | 11,065 |
| Offutt AFB | NE | Midwest | 38,396 |
| Peterson AFB | CO | Midwest | 36,133 |
| Randolph AFB | TX | Midwest | 47,655 |
| Reese AFB | TX | Midwest | 8,500 |
| Sheppard AFB | TX | Midwest | 21,178 |
| Tinker AFB | OK | Midwest | 50,204 |
| U.S. Air Force Academy | CO | Midwest | 17,809 |
| Vance AFB | OK | Midwest | 5,349 |
| White Sands | NM | Midwest | 4,541 |
| Subtotal, Midwest Region (42 stores) | | | 916,127 |
| Aberdeen | MD | Northeast | 14,053 |
| Andrews AFB | MD | Northeast | 46,583 |
| Annapolis | MD | Northeast | 8,798 |
| ARDEC | PA | Northeast | 4,053 |
| Argentia | Newfoundland, Canada | Northeast | 881 |
| Bangor Air National Guard Base | ME | Northeast | 6,298 |
| Bolling AFB | DC | Northeast | 26,564 |
| Brunswick | ME | Northeast | 10,685 |
| Cameron Station | VA | Northeast | 35,425 |
| Carlisle Barracks | PA | Northeast | 12,270 |
| Charles E. Kelly | PA | Northeast | 9,831 |
| Cutler | ME | Northeast | 637 |
| Dahlgren | VA | Northeast | 1,280 |
| Dover AFB | DE | Northeast | 23,600 |
| Edgewood | MD | Northeast | 8,336 |
| Ft. Belvoir | VA | Northeast | 78,171 |
| Ft. Detrick | MD | Northeast | 1,856 |
| Ft. Devens | MA | Northeast | 24,085 |
| Ft. Drum | NY | Northeast | 24,582 |
| Ft. Hamilton | NY | Northeast | 12,128 |

Source: Interservice, Winter 1993.

| Commissary | State/country | Region | 1992 Sales (\$000) |
|--|---------------|-------------------|--------------------|
| Ft. McNair | DC | Northeast | 4,232 |
| Ft. Meade | MD | Northeast | 59,845 |
| Ft. Monmouth | NJ | Northeast | 22,825 |
| Ft. Myer | VA | Northeast | 24,738 |
| Ft. Ritchie | MD | Northeast | 6,913 |
| Governor's Island | NY | Northeast | 3,625 |
| Griffiss AFB | NY | Northeast | 18,724 |
| Hanscom AFB | MA | Northeast | 23,363 |
| Lakehurst | NJ | Northeast | 2,861 |
| Loring AFB | ME | Northeast | 10,005 |
| McGuire AFB | NJ | Northeast | 59,650 |
| Mitchel Field | NY | Northeast | 8,097 |
| New Cumberland | PA | Northeast | 6,730 |
| New London | CT | Northeast | 24,269 |
| New York Naval Station (NS) | NY | Northeast | 1,724 |
| Newport | RI | Northeast | 14,754 |
| Patuxent River | MD | Northeast | 8,319 |
| Philadelphia | PA | Northeast | 9,254 |
| Plattsburgh AFB | NY | Northeast | 12,774 |
| Quantico | VA | Northeast | 27,609 |
| Scotia | NY | Northeast | 4,343 |
| Seneca | NY | Northeast | 3,618 |
| Tobyhanna | PA | Northeast | 7,094 |
| Vint Hill Farms | VA | Northeast | 8,834 |
| Walter Reed | DC | Northeast | 26,278 |
| West Point | NY | Northeast | 18,363 |
| Winter Harbor | ME | Northeast | 819 |
| Subtotal, Northeast Region (47 stores) | | | 769,776 |
| Adak | AK | Northwest/Pacific | 5,191 |
| Andersen AFB | Guam | Northwest/Pacific | 22,426 |
| Atsugi | Japan | Northwest/Pacific | 5,204 |
| Bangor | WA | Northwest/Pacific | 18,729 |
| Barbers Point | HI | Northwest/Pacific | 9,086 |
| Bremerton | WA | Northwest/Pacific | 10,723 |
| Camp Carroll | Korea | Northwest/Pacific | 1,423 |
| Camp Casey | Korea | Northwest/Pacific | 8,336 |
| Camp Courtney | Okinawa | Northwest/Pacific | 6,215 |
| Camp Edwards | Korea | Northwest/Pacific | 788 |
| Camp Foster | Okinawa | Northwest/Pacific | 18,283 |

Source: Interservice, Winter 1993.

| Commissary | State/country | Region | 1992 Sales (\$000) |
|----------------------|---------------|-------------------|--------------------|
| Camp Humphreys | Korea | Northwest/Pacific | 3,274 |
| Camp Kinser | Okinawa | Northwest/Pacific | 10,523 |
| Camp Kure | Japan | Northwest/Pacific | 79 |
| Camp Page | Korea | Northwest/Pacific | 751 |
| Camp Stanley | Korea | Northwest/Pacific | 2,225 |
| Camp Zama | Japan | Northwest/Pacific | 1,945 |
| Chinhae | Korea | Northwest/Pacific | 557 |
| Conrad AFS | MT | Northwest/Pacific | 152 |
| Eielson AFB | AK | Northwest/Pacific | 9,581 |
| Elmendorf AFB | AK | Northwest/Pacific | 32,219 |
| Exmouth | Australia | Northwest/Pacific | 691 |
| Fairchild AFB | WA | Northwest/Pacific | 31,379 |
| Ft. Greely | AK | Northwest/Pacific | 2,378 |
| Ft. Lewis | WA | Northwest/Pacific | 64,479 |
| Ft. Richardson | AK | Northwest/Pacific | 16,299 |
| Ft. Shafter | HI | Northwest/Pacific | 9,175 |
| Ft. Wainwright | AK | Northwest/Pacific | 18,228 |
| Guam | Guam | Northwest/Pacific | 19,194 |
| Hannam Village | Korea | Northwest/Pacific | 1,600 |
| Havre AFB | MT | Northwest/Pacific | 165 |
| Hickam AFB | HI | Northwest/Pacific | 53,234 |
| Iwakuni | Japan | Northwest/Pacific | 3,776 |
| Kadena | Okinawa | Northwest/Pacific | 26,785 |
| Kaneohe Bay | HI | Northwest/Pacific | 14,715 |
| Kunsan AFB | Korea | Northwest/Pacific | 2,418 |
| Malmstrom AFB | MT | Northwest/Pacific | 15,364 |
| McChord AFB | WA | Northwest/Pacific | 66,373 |
| Misawa Air Base (AB) | Japan | Northwest/Pacific | 15,721 |
| Mountain Home AFB | ID | Northwest/Pacific | 11,680 |
| Osan AB | Korea | Northwest/Pacific | 23,531 |
| Pearl Harbor | HI | Northwest/Pacific | 53,714 |
| Powell AFS | WY | Northwest/Pacific | 440 |
| Pusan | Korea | Northwest/Pacific | 2,896 |
| Sagami | Japan | Northwest/Pacific | 334 |
| Sagamihara | Japan | Northwest/Pacific | 6,642 |
| Sasebo | Japan | Northwest/Pacific | 2,253 |
| Schofield Barracks | HI | Northwest/Pacific | 40,085 |
| Seattle | WA | Northwest/Pacific | 17,026 |
| Subic Bay | Philippines | Northwest/Pacific | 11,959 |

Source: Interservice, Winter 1993.

| Commissary | State/country | Region | 1992 Sales (\$000) |
|--|---------------|-------------------|--------------------|
| Taegu Air Station | Korea | Northwest/Pacific | 5,381 |
| Whidbey Island NAS | WA | Northwest/Pacific | 20,577 |
| Wilder AFS | ID | Northwest/Pacific | 499 |
| Yokosuka | Japan | Northwest/Pacific | 14,738 |
| Yokota AB | Japan | Northwest/Pacific | 16,431 |
| Yongsan | Korea | Northwest/Pacific | 43,423 |
| Subtotal, Northwest/Pacific Region (56 stores) | | | 801,293 |
| Albany | GA | Southern | 5,465 |
| Arnold AFS | TN | Southern | 5,259 |
| Athens | GA | Southern | 2,401 |
| Avon Park | FL | Southern | 1,817 |
| Barksdale AFB | LA | Southern | 36,158 |
| Camp Merrill | GA | Southern | 524 |
| Cecil Field NS | FL | Southern | 5,946 |
| Charleston AFB | SC | Southern | 28,674 |
| Charleston NS | SC | Southern | 9,731 |
| Charleston Naval Weapons Station | SC | Southern | 19,187 |
| Columbus AFB | MS | Southern | 11,356 |
| Corozal | Panama | Southern | 24,038 |
| Eglin AFB | FL | Southern | 39,332 |
| England AFB | LA | Southern | 11,507 |
| Espinar | Panama | Southern | 3,507 |
| Ft. Benning | GA | Southern | 47,972 |
| Ft. Buchanan | Puerto Rico | Southern | 28,167 |
| Ft. Gillem | GA | Southern | 27,867 |
| Ft. Gordon | GA | Southern | 29,769 |
| Ft. Jackson | SC | Southern | 33,769 |
| Ft. McClellan | AL | Southern | 22,283 |
| Ft. McPherson | GA | Southern | 5,670 |
| Ft. Polk | LA | Southern | 29,085 |
| Ft. Rucker | AL | Southern | 26,923 |
| Ft. Stewart | GA | Southern | 23,126 |
| Gulfport | MS | Southern | 5,175 |
| Gunter AFB | AL | Southern | 11,850 |
| Homestead AFB | FL | Southern | 29,602 |
| Howard AFB | Panama | Southern | 6,521 |
| Hunter Army Airfield | GA | Southern | 12,742 |
| Hurlburt Field | FL | Southern | 21,442 |
| Jacksonville | FL | Southern | 44,772 |

Source: Interservice, Winter 1993.

| Commissary | State/country | Region | 1992 Sales (\$000) |
|---------------------------------------|---------------|-----------|--------------------|
| Keesler AFB | MS | Southern | 40,081 |
| Key West | FL | Southern | 5,639 |
| Kings Bay | GA | Southern | 7,712 |
| MacDill AFB | FL | Southern | 70,405 |
| Maxwell AFB | AL | Southern | 27,721 |
| Mayport | FL | Southern | 13,195 |
| Memphis | TN | Southern | 19,940 |
| Meridian | MS | Southern | 4,318 |
| Moody AFB | GA | Southern | 11,423 |
| Myrtle Beach AFB | SC | Southern | 11,497 |
| New Orleans | LA | Southern | 10,067 |
| Orlando | FL | Southern | 21,567 |
| Parris Island | SC | Southern | 8,179 |
| Patrick AFB | FL | Southern | 43,458 |
| Pensacola | FL | Southern | 29,786 |
| Redstone Arsenal | AL | Southern | 29,118 |
| Robins AFB | GA | Southern | 23,594 |
| Roosevelt Roads NS | Puerto Rico | Southern | 10,049 |
| Shaw AFB | SC | Southern | 18,899 |
| Tyndall AFB | FL | Southern | 24,005 |
| Whiting Field | FL | Southern | 4,631 |
| Subtotal, Southern Region (53 stores) | | | 1,046,921 |
| Alameda | CA | Southwest | 21,761 |
| Barstow | CA | Southwest | 3,820 |
| Beale AFB | CA | Southwest | 17,167 |
| Camp Pendleton | CA | Southwest | 32,335 |
| Castle AFB | CA | Southwest | 24,060 |
| China Lake | CA | Southwest | 3,211 |
| Davis Monthan AFB | AZ | Southwest | 36,271 |
| Dugway Proving Grounds | UT | Southwest | 1,882 |
| Edwards AFB | CA | Southwest | 18,349 |
| El Centro | CA | Southwest | 1,154 |
| El Toro | CA | Southwest | 23,419 |
| Fallon NAS | NV | Southwest | 3,189 |
| Ft. Huachuca | AZ | Southwest | 20,528 |
| Ft. Irwin | CA | Southwest | 9,612 |
| Ft. Ord | CA | Southwest | 44,791 |
| George AFB | CA | Southwest | 13,885 |
| Gila Bend AFS | AZ | Southwest | 420 |

Source: Interservice, Winter 1993.

| Commissary | State/country | Region | 1992 Sales (\$000) |
|--|---------------|-----------|--------------------|
| Hamilton | CA | Southwest | 11,134 |
| Hill AFB | UT | Southwest | 31,081 |
| Holbrook AFS | AZ | Southwest | 330 |
| Ft. Hunter Ligget | CA | Southwest | 718 |
| Imperial Beach | CA | Southwest | 32,818 |
| Lemoore | CA | Southwest | 9,769 |
| Long Beach | CA | Southwest | 26,694 |
| Los Angeles AFB | CA | Southwest | 15,123 |
| Luke AFB | AZ | Southwest | 35,624 |
| March AFB | CA | Southwest | 34,735 |
| Mare Island | CA | Southwest | 10,836 |
| Mather AFB | CA | Southwest | 33,755 |
| McClellan AFB | CA | Southwest | 43,276 |
| Miramar | CA | Southwest | 60,664 |
| Moffett Field | CA | Southwest | 25,620 |
| Nellis AFB | NV | Southwest | 51,836 |
| North Island | CA | Southwest | 8,227 |
| Norton AFB | CA | Southwest | 34,226 |
| Oakland | CA | Southwest | 8,110 |
| Point Mugu | CA | Southwest | 3,615 |
| Port Hueneme | CA | Southwest | 15,715 |
| Presidio San Francisco | CA | Southwest | 19,704 |
| San Diego NS | CA | Southwest | 54,237 |
| San Diego Naval Training Center | CA | Southwest | 9,746 |
| San Onofre | CA | Southwest | 4,695 |
| Sierra | CA | Southwest | 1,892 |
| Skaggs Island | CA | Southwest | 105 |
| Stockton | CA | Southwest | 3,391 |
| Travis AFB | CA | Southwest | 49,448 |
| Treasure Island NS | CA | Southwest | 3,607 |
| Twentynine Palms | CA | Southwest | 10,966 |
| Vandenberg AFB | CA | Southwest | 20,725 |
| Williams AFB | AZ | Southwest | 19,792 |
| Yuma | AZ | Southwest | 6,437 |
| Yuma Proving Grounds | AZ | Southwest | 2,123 |
| Subtotal, Southwest Region (52 stores) | | | 976,628 |
| Amberg | Germany | European | 744 |
| Ankara | Turkey | European | 3,203 |
| Ansbach | Germany | European | 6,587 |

Source: Interservice, Winter 1993.

| Commissary | State/country | Region | 1992 Sales (\$000) |
|---------------|---------------|----------|--------------------|
| Aschaffenberg | Germany | European | 4,605 |
| Athens | Greece | European | 1,369 |
| Augsburg | Germany | European | 9,907 |
| Aviano AB | Italy | European | 6,308 |
| Babenhausen | Germany | European | 1,822 |
| Bad Aibling | Germany | European | 2,148 |
| Bad Hersfeld | Germany | European | 1,851 |
| Bad Kissingen | Germany | European | 805 |
| Bad Kreuznach | Germany | European | 5,005 |
| Bad Nauheim | Germany | European | 2,806 |
| Bamberg | Germany | European | 5,821 |
| Baumholder | Germany | European | 11,068 |
| Berlin | Germany | European | 13,140 |
| Bindlach | Germany | European | 846 |
| Bitburg AB | Germany | European | 15,018 |
| Bremerhaven | Germany | European | 4,694 |
| Buedingen | Germany | European | 1,062 |
| Bueren | Germany | European | 168 |
| Cairo | Egypt | European | 1,958 |
| Camp King | Germany | European | 657 |
| Chievres | Belgium | European | 9,097 |
| Crailsheim | Germany | European | 1,180 |
| Darmstadt | Germany | European | 6,898 |
| Dexheim | Germany | European | 1,628 |
| Dhahran | Saudi Arabia | European | 1,850 |
| Edzell | Scotland | European | 2,474 |
| Erlangen | Germany | European | 3,312 |
| Fischbach | Germany | European | 120 |
| Flensburg | Germany | European | 226 |
| Fliegerhorst | Germany | European | 861 |
| Frankfurt | Germany | European | 19,363 |
| Fuerth | Germany | European | 19,505 |
| Fulda | Germany | European | 6,513 |
| Garlstedt | Germany | European | 5,051 |
| Garmisch | Germany | European | 1,358 |
| Gelnhausen | Germany | European | 1,423 |
| Germersheim | Germany | European | 413 |
| Giebelstadt | Germany | European | 646 |
| Giessen | Germany | European | 9,586 |

Source: Interservice, Winter 1993.

| Commissary | State/country | Region | 1992 Sales (\$000) |
|---------------------------------|---------------|----------|--------------------|
| Goeppingen | Germany | European | 192 |
| Grafenwoehr | Germany | European | 4,317 |
| Hahn AB | Germany | European | 7,930 |
| Hanau | Germany | European | 21,553 |
| Heidelberg | Germany | European | 21,655 |
| Heilbronn | Germany | European | 2,038 |
| Herzo Base | Germany | European | 404 |
| Hohenfels | Germany | European | 2,733 |
| Holy Loch | Scotland | European | 929 |
| Idar Oberstein | Germany | European | 668 |
| Illesheim | Germany | European | 2,786 |
| Incirlik | Turkey | European | 8,951 |
| Iraklion | Greece | European | 2,936 |
| Izmir | Turkey | European | 3,213 |
| Karlsruhe | Germany | European | 7,529 |
| Keflavik | Iceland | European | 6,186 |
| Kelley Barracks | Germany | European | 1,616 |
| Kirchgoens | Germany | European | 1,701 |
| Kitzingen | Germany | European | 4,870 |
| Lajes Field | Azores | European | 6,468 |
| Landstuhl | Germany | European | 566 |
| Livorno | Italy | European | 4,094 |
| Mainz | Germany | European | 5,176 |
| Mannheim | Germany | European | 15,363 |
| McCully Barracks | Germany | European | 416 |
| Menwith Hill | England | European | 3,753 |
| Mildenhall | England | European | 1,516 |
| Muenster | Germany | European | 446 |
| Munich | Germany | European | 4,448 |
| Naples | Italy | European | 14,214 |
| Neubruেকে | Germany | European | 759 |
| Oslo | Norway | European | 1,567 |
| Panzer | Germany | European | 703 |
| Patch Barracks | Germany | European | 7,739 |
| Pirmasens | Germany | European | 4,483 |
| Pruem | Germany | European | 98 |
| Royal Air Force (RAF) Alconbury | England | European | 9,328 |
| RAF Bentwaters | England | European | 11,672 |

Source: Interservice, Winter 1993.

| Commissary | State/country | Region | 1992 Sales (\$000) |
|--------------------------|---------------|----------|--------------------|
| RAF Burtonwood | England | European | 188 |
| RAF Chicksands | England | European | 4,138 |
| RAF Fairford | England | European | 1,382 |
| RAF Greenham Common | England | European | 1,882 |
| RAF Lakenheath | England | European | 23,535 |
| RAF Sculthorpe | England | European | 90 |
| RAF Upper Heyford | England | European | 14,061 |
| Ramstein AB | Germany | European | 37,059 |
| Regensburg | Germany | European | 98 |
| Rhein-Main AB | Germany | European | 22,618 |
| Riyadh | Saudi Arabia | European | 4,797 |
| Robinson Barracks | Germany | European | 11,700 |
| Rota | Spain | European | 9,988 |
| Royal Oaks | Spain | European | 346 |
| San Vito AS | Italy | European | 4,128 |
| Schinnen | Netherlands | European | 7,175 |
| Schwabach | Germany | European | 141 |
| Schwaebisch Hall | Germany | European | 1,135 |
| Schweinfurt | Germany | European | 10,497 |
| Sembach AB | Germany | European | 6,213 |
| Sigonella | Italy | European | 7,520 |
| Soesterberg | Netherlands | European | 5,351 |
| Sogel | Germany | European | 216 |
| Sondestrom | Greenland | European | 0 |
| Spangdahlem AB | Germany | European | 9,175 |
| Thule | Greenland | European | 0 |
| Torrejon AB | Spain | European | 6,939 |
| Trier | Germany | European | 174 |
| Vicenza | Italy | European | 8,705 |
| Vilseck | Germany | European | 8,918 |
| Vogelweh AB | Germany | European | 20,855 |
| Wertem | Germany | European | 800 |
| Wiesbaden | Germany | European | 19,223 |
| Wildflecken | Germany | European | 2,906 |
| Wildflecken Sub-Facility | Germany | European | 544 |
| Worms | Germany | European | 3,040 |
| Wuerzburg | Germany | European | 13,912 |

Source: Interservice, Winter 1993.

| Commissary | State/country | Region | 1992 Sales (\$000) |
|--|---------------|----------|-----------------------|
| Zaragoza AB | Spain | European | 1,461 |
| Zweibruecken | Germany | European | 5,155 |
| Subtotal, European Region (119 stores) | | | 664,177 |
| Total (411 stores) | | | 6,024,524 |

Source: Interservice, Winter 1993.

APPENDIX B

Key External Trading Partners

Table B-1 lists the 700 largest external (i.e., commercial) trading partners in terms of volumes of invoices submitted to the Defense Commissary Agency (DeCA) during a 3-month period (August - October 1992). The table also shows the dollar value of the invoices submitted and the location of the trading partner.

In general, we recommend that DeCA begin by establishing electronic data interchange (EDI) trading partner relationships with its largest volume vendors. Nevertheless, other factors may determine the implementation order, including EDI capabilities, willingness to participate in the program, and dollar value of invoices.

Table B-1.
Top 700 Trading Partners

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|----------------------|-------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 1 | Proctor & Gamble | Cincinnati, OH | 6,926 | 1.1 | 64,369 | 1 |
| 2 | Kraft General Foods | Glenview, IL | 6,324 | 2.1 | 5,903 | 41 |
| 3 | George A. Hormel | Austin, MN | 6,252 | 3.1 | 9,913 | 21 |
| 4 | Oscar Mayer Foods | Madison, WI | 5,640 | 4.0 | 17,043 | 8 |
| 5 | Coca Cola Foods | Atlanta, GA | 5,163 | 4.8 | 6,815 | 33 |
| 6 | Quaker Oats Co. | Barrington, IL | 5,147 | 5.6 | 15,474 | 9 |
| 7 | Pillsbury Company | Minneapolis, MN | 5,070 | 6.5 | 9,857 | 22 |
| 8 | Campbell Soup Co. | Camden, NJ | 4,723 | 7.2 | 19,336 | 6 |
| 9 | Ore-Ida Foods | Boise, ID | 4,711 | 8.0 | 4,120 | 62 |
| 10 | Tropicana Products | Bradenton, FL | 4,592 | 8.7 | 4,008 | 65 |
| 11 | Nestle Food Corp. | Glendale, CA | 4,554 | 9.4 | 14,449 | 12 |
| 12 | Hartz Mountain Corp. | Harrison, NJ | 4,369 | 10.1 | 1,452 | 143 |
| 13 | Seneca Foods Co. | Chicago, IL | 4,340 | 10.8 | 2,508 | 91 |
| 14 | Nabisco Foods Group | Parsippany, NJ | 4,009 | 11.4 | 10,098 | 20 |
| 15 | Swift Eckrich Inc. | Downers Grove, IL | 3,988 | 12.1 | 3,895 | 66 |
| 16 | Eurpac Service Co. | Irving, TX | 3,839 | 12.7 | 5,499 | 46 |
| 17 | Borden, Inc. | Columbus, OH | 3,805 | 13.3 | 3,476 | 73 |
| 18 | Monarch Crown Co. | Dallas, TX | 3,657 | 13.9 | 5,050 | 49 |
| 19 | Kraft USA | Glenview, IL | 3,640 | 14.5 | 27,342 | 4 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|-------------------------------|----------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 20 | Best Foods, Inc. | Englewood Cliffs, NJ | 3,432 | 15.0 | 6,111 | 39 |
| 21 | General Mills, Inc. | Minneapolis, MN | 3,264 | 15.5 | 26,043 | 5 |
| 22 | Philip Morris, Inc. | Richmond, VA | 3,260 | 16.0 | 45,567 | 2 |
| 23 | McCormick and Co. | Hunt Valley, MD | 3,223 | 16.6 | 5,241 | 47 |
| 24 | Welch's | Westfield, NY | 3,204 | 17.1 | 1,564 | 137 |
| 25 | Hillshire Farm | Cincinnati, OH | 3,139 | 17.6 | 3,437 | 74 |
| 26 | Nestle Beverage | San Francisco, CA | 3,084 | 18.1 | 7,921 | 28 |
| 27 | Conagra, Inc. | Omaha, NE | 3,073 | 18.6 | 0 | 29 |
| 28 | Mid Valley Prod. | Hartford, CT | 3,060 | 19.0 | 2,141 | 105 |
| 29 | Lykes Pasco Pkg. | Minneapolis, MN | 2,978 | 19.5 | 2,181 | 104 |
| 30 | Pet, Inc. | St. Louis, MO | 2,900 | 20.0 | 4,732 | 53 |
| 31 | Conagra Poultry Co. | El Dorado, AR | 2,772 | 20.4 | 6,210 | 36 |
| 32 | Keebler Company | Elmhurst, IL | 2,697 | 20.8 | 4,818 | 51 |
| 33 | Armour Food Co. | Omaha, NE | 2,603 | 21.3 | 1,913 | 114 |
| 34 | Tree Top Inc. | Chicago, IL | 2,596 | 21.7 | 1,247 | 161 |
| 35 | Reckitt & Colman, Inc. | Lehigh Valley, PA | 2,561 | 22.1 | 4,042 | 64 |
| 36 | Frito-Lay, Inc. | Plano, TX | 2,519 | 22.5 | 10,296 | 18 |
| 37 | Dole Packaged Foods Co. | San Francisco, CA | 2,476 | 22.9 | 1,196 | 167 |
| 38 | Miles, Inc. | Elkhart, IN | 2,366 | 23.3 | 1,449 | 144 |
| 39 | Pepperidge Farm | Norwalk, CT | 2,350 | 23.6 | 2,686 | 87 |
| 40 | Gerber Products Co. | Fremont, MI | 2,323 | 24.0 | 3,080 | 80 |
| 41 | Mead Johnson | Dallas, TX | 2,218 | 24.4 | 3,261 | 78 |
| 42 | Tyson Foods, Inc. | Springdale, AR | 2,213 | 24.7 | 6,136 | 38 |
| 43 | H. J. Heinz Co. | Pittsburgh, PA | 2,133 | 25.0 | 4,587 | 54 |
| 44 | Hunt Wesson, Inc. | Fullerton, CA | 2,070 | 25.4 | 10,179 | 19 |
| 45 | Alberto Culver | Chicago, IL | 2,054 | 25.7 | 1,629 | 131 |
| 46 | All American Gourmet | San Bernardino, CA | 2,006 | 26.0 | 4,439 | 55 |
| 47 | Mrs. Smith's Pies | Pottstown, PA | 1,960 | 26.3 | 2,213 | 101 |
| 48 | Clorox Company | Oakland, CA | 1,957 | 26.7 | 7,077 | 32 |
| 49 | Weight Watchers | Pittsburgh, PA | 1,941 | 27.0 | 1,856 | 119 |
| 50 | Pictsweet Frozen | Charlotte, NC | 1,937 | 27.3 | 2,649 | 90 |
| 51 | Gorton's of Gloucester | Gloucester, MA | 1,923 | 27.6 | 1,331 | 155 |
| 52 | Vip Sales Co., Inc. | Tulsa, OK | 1,896 | 27.9 | 2,047 | 108 |
| 53 | Lance Inc. | Charlotte, NC | 1,880 | 28.2 | 1,033 | 188 |
| 54 | Van Den Bergh Foods Co. | Lisle, IN | 1,875 | 28.5 | 2,710 | 86 |
| 55 | Interstate Brands Corp. | Kansas City, MO | 1,848 | 28.8 | 1,690 | 128 |
| 56 | Playtex Family Products Corp. | Dover, DE | 1,835 | 29.1 | 1,397 | 148 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|--------------------------------------|-------------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 57 | Nabisco Biscuit | Parsippany, NJ | 1,807 | 29.4 | 13,109 | 13 |
| 58 | R. J. Reynolds Tobacco International | Winston-Salem, NC | 1,798 | 29.6 | 34,163 | 3 |
| 59 | Brown & Williamson Tobacco | Louisville, KY | 1,784 | 29.9 | 15,370 | 10 |
| 60 | Lenders Bagel Bakery | West Haven, CT | 1,758 | 30.2 | 739 | 228 |
| 61 | John Morrell | Cincinnati, OH | 1,749 | 30.5 | 3,380 | 75 |
| 62 | James River Corp. | Norwalk, CT | 1,696 | 30.8 | 6,740 | 34 |
| 63 | Schreiber Foods, Inc. | Green Bay, WI | 1,685 | 31.0 | 2,247 | 99 |
| 64 | Ralston Purina Co. | St. Louis, MO | 1,681 | 31.3 | 9,722 | 23 |
| 65 | Stouffer Foods | Solon, OH | 1,677 | 31.6 | 2,932 | 82 |
| 66 | L & F Products | Newark, NJ | 1,656 | 31.8 | 1,840 | 120 |
| 67 | Sunshine Biscuits, Inc. | Oakland, CA | 1,656 | 32.1 | 3,809 | 68 |
| 68 | Dow Brands, Inc. | Indianapolis, IN | 1,642 | 32.3 | 4,321 | 58 |
| 69 | Nestle Food Corp. | Glendale, CA | 1,636 | 32.6 | 865 | 209 |
| 70 | JFC International | South San Francisco, CA | 1,633 | 32.9 | 2,043 | 109 |
| 71 | Giorgio Foods, Inc. | Tempe, PA | 1,624 | 33.1 | 606 | 257 |
| 72 | J. R. Simplot | Chicago, IL | 1,619 | 33.4 | 634 | 250 |
| 73 | Foster Foods | San Francisco, CA | 1,609 | 33.6 | 4,206 | 60 |
| 74 | Chef America | Los Angeles, CA | 1,604 | 33.9 | 929 | 203 |
| 75 | Tony's Pizza Service | Marshall, MN | 1,597 | 34.1 | 2,242 | 100 |
| 76 | International Multifoods | Dallas, TX | 1,590 | 34.4 | 1,160 | 173 |
| 77 | Dairy Fresh Corp. | Hattiesburg, MS | 1,576 | 34.7 | 1,387 | 149 |
| 78 | Golden Grain Co. | San Francisco, CA | 1,576 | 34.9 | 2,667 | 88 |
| 79 | Mapelli Food | Medford, OR | 1,569 | 35.2 | 8,770 | 27 |
| 80 | Scott Paper Company | Philadelphia, PA | 1,566 | 35.4 | 5,954 | 40 |
| 81 | Jimmy Dean Foods | Dallas, TX | 1,563 | 35.7 | 950 | 199 |
| 82 | Whitehall Laboratories | Chicago, IL | 1,557 | 35.9 | 1,982 | 110 |
| 83 | Dove International | Chicago, IL | 1,542 | 36.1 | 933 | 202 |
| 84 | Kal-Kan Pet Food | Mt. Olive, NJ | 1,542 | 36.4 | 3,512 | 72 |
| 85 | Jillson Dist., Inc. | San Diego, CA | 1,535 | 36.6 | 467 | 305 |
| 86 | American Home Food Products | Milton, PA | 1,528 | 36.9 | 4,119 | 63 |
| 87 | Georgia-Pacific | Atlanta, GA | 1,524 | 37.1 | 2,195 | 103 |
| 88 | Hershey Pasta Group | Hershey, PA | 1,522 | 37.4 | 1,630 | 130 |
| 89 | Warner-Lambert Company, Inc. | Morris Plains, NJ | 1,518 | 37.6 | 5,513 | 45 |
| 90 | Industries | Honolulu, HI | 1,512 | 37.8 | 3,365 | 76 |
| 91 | Liggett Group, Inc. | Durham, NC | 1,509 | 38.1 | 8,786 | 26 |
| 92 | Heinz Pet Products | Palatine, IL | 1,504 | 38.3 | 1,577 | 135 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|-------------------------|--------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 93 | Motts USA | Philadelphia, PA | 1,501 | 38.6 | 1,603 | 134 |
| 94 | Land O'Lakes, Inc. | Minneapolis, MN | 1,498 | 38.8 | 4,160 | 61 |
| 95 | Thomas J. Lipton | Pittsburgh, PA | 1,491 | 39.0 | 7,223 | 30 |
| 96 | Mobil Chemical Co. | Pittsford, NY | 1,487 | 39.3 | 2,477 | 92 |
| 97 | Sargento Cheese | Chicago, IL | 1,486 | 39.5 | 1,705 | 127 |
| 98 | M & M/Mars | Mt. Olive, NJ | 1,484 | 39.8 | 6,458 | 35 |
| 99 | L'eggs Products | Atlanta, GA | 1,483 | 40.0 | 1,613 | 132 |
| 100 | American Tobacco Co. | Chester, VA | 1,482 | 40.2 | 10,981 | 15 |
| 101 | Rainbow Baking | Sacramento, CA | 1,475 | 40.5 | 1,553 | 139 |
| 102 | S. C. Johnson & Johnson | Milwaukee, WI | 1,475 | 40.7 | 6,144 | 37 |
| 103 | Dial Corporation | Los Angeles, CA | 1,472 | 40.9 | 5,175 | 48 |
| 104 | J M Smucker Co. | Cleveland, OH | 1,469 | 41.2 | 2,414 | 95 |
| 105 | Ross Labs | Columbus, OH | 1,469 | 41.4 | 5,582 | 44 |
| 106 | 3M Consumer Products | Minneapolis, MN | 1,467 | 41.6 | 619 | 254 |
| 107 | Hershey Chocolate | Columbus, OH | 1,466 | 41.9 | 5,825 | 43 |
| 108 | John Morrell Co. | Columbus, OH | 1,461 | 42.1 | 3,670 | 69 |
| 109 | Ocean Spray Cranberry | Charlotte, NC | 1,458 | 42.3 | 3,838 | 67 |
| 110 | Del Monte Corp. | Charlotte, NC | 1,456 | 42.6 | 9,381 | 25 |
| 111 | Duracell USA | Honolulu, HI | 1,455 | 42.8 | 2,199 | 102 |
| 112 | E J Brach Corp. | Chicago, IL | 1,445 | 43.0 | 1,491 | 142 |
| 113 | Carl Buddig | Chicago, IL | 1,441 | 43.3 | 449 | 314 |
| 114 | Maruchan, Inc. | Los Angeles, CA | 1,436 | 43.5 | 1,055 | 186 |
| 115 | Slim Fast Foods | New York, NY | 1,421 | 43.7 | 1,146 | 174 |
| 116 | Isaly Klondike | Tampa, FL | 1,418 | 43.9 | 603 | 258 |
| 117 | Van Camp Seafood | Charlotte, NC | 1,417 | 44.2 | 1,713 | 126 |
| 118 | Star Kist Seafood | Pasadena, CA | 1,407 | 44.4 | 3,600 | 70 |
| 119 | Singleton Seafood | Tampa, FL | 1,405 | 44.6 | 876 | 207 |
| 120 | American Pop Co. | Sioux City, IA | 1,403 | 44.8 | 339 | 357 |
| 121 | Church Dwight Co. | Chicago, IL | 1,400 | 45.1 | 1,184 | 170 |
| 122 | Professional | Salt Lake City, UT | 1,398 | 45.3 | 5,902 | 42 |
| 123 | Milbrands, Inc. | Dallas, TX | 1,392 | 45.5 | 637 | 248 |
| 124 | Presto Products | Milwaukee, WI | 1,391 | 45.7 | 1,777 | 122 |
| 125 | Turn Key Mgmt. | Bethesda, MD | 1,389 | 45.9 | 927 | 204 |
| 126 | Pet, Inc. Grocery | Dallas, TX | 1,388 | 46.2 | 1,002 | 195 |
| 127 | Bisek And Co. | Virginia Beach, VA | 1,387 | 46.4 | 446 | 315 |
| 128 | Benckiser Consultants | Charlotte, NC | 1,381 | 46.6 | 1,879 | 116 |
| 129 | Reynolds Metals | Detroit, MI | 1,374 | 46.8 | 2,434 | 94 |
| 130 | Morton International | Chicago, IL | 1,366 | 47.0 | 551 | 277 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|---------------------|-------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 131 | Oriental Trading | Sausalito, CA | 1,366 | 47.3 | 1,606 | 133 |
| 132 | Maple Leaf Farm | Milwaukee, WI | 1,358 | 47.5 | 758 | 222 |
| 133 | Nutrasweet Co. | Chicago, IL | 1,352 | 47.7 | 1,566 | 136 |
| 134 | Kellogg Sales | Dallas, TX | 1,351 | 47.9 | 12,717 | 14 |
| 135 | Sun Diamond Group | Pleasanton, CA | 1,349 | 48.1 | 1,404 | 147 |
| 136 | Kingsford Co. | Dallas, TX | 1,335 | 48.3 | 1,068 | 185 |
| 137 | Schering-Plough | Atlanta, GA | 1,321 | 48.5 | 1,346 | 154 |
| 138 | Universal Foods | Snow Hill, NC | 1,319 | 48.8 | 1,914 | 113 |
| 139 | Alpo Pet Foods | Charlotte, NC | 1,317 | 49.0 | 1,946 | 112 |
| 140 | Kikkoman Intl. | Chicago, IL | 1,317 | 49.2 | 751 | 225 |
| 141 | Stokely USA, Inc. | Milwaukee, WI | 1,311 | 49.4 | 1,104 | 179 |
| 142 | Worthington Food | Columbus, OH | 1,302 | 49.6 | 271 | 401 |
| 143 | Faultless | Kansas City, MO | 1,287 | 49.8 | 304 | 380 |
| 144 | Uncle Bens, Inc. | Atlanta, GA | 1,285 | 50.0 | 1,199 | 186 |
| 145 | Gillette Co. | Pittsburgh, PA | 1,284 | 50.2 | 4,438 | 56 |
| 146 | Johnson & Johnson | Chicago, IL | 1,284 | 50.4 | 9,605 | 24 |
| 147 | AGS Foods, Inc. | Calimesa, CA | 1,278 | 50.6 | 2,954 | 81 |
| 148 | Kimberly Clark | Charlotte, NC | 1,272 | 50.8 | 14,523 | 11 |
| 149 | G. E. Lighting | Chicago, IL | 1,269 | 51.0 | 1,317 | 156 |
| 150 | Continental Baking | St. Louis, MO | 1,255 | 51.2 | 1,175 | 172 |
| 151 | Schmidt Baking | Baltimore, MD | 1,264 | 51.4 | 560 | 271 |
| 152 | Fleming Foods | Topeka, KS | 1,254 | 51.6 | 1,361 | 152 |
| 153 | Smithkline Beecham | Pittsburgh, PA | 1,249 | 51.8 | 1,650 | 128 |
| 154 | St. Ives Labs | Chicago, IL | 1,249 | 52.0 | 482 | 299 |
| 155 | Musselman | Philadelphia, PA | 1,245 | 52.2 | 625 | 252 |
| 156 | Bar S Foods Co. | Columbus, OH | 1,242 | 52.4 | 2,128 | 106 |
| 157 | Rice Growers Assoc. | Sacramento, CA | 1,240 | 52.6 | 766 | 219 |
| 158 | Pace Foods | Dallas, TX | 1,238 | 52.8 | 1,091 | 181 |
| 159 | 3M O-Cel-O Sponge | Minneapolis, MN | 1,236 | 53.0 | 201 | 461 |
| 160 | Solo Cup Co. | Charlotte, NC | 1,236 | 53.2 | 344 | 353 |
| 161 | Capri Sun, Inc. | San Francisco, CA | 1,234 | 53.4 | 1,017 | 190 |
| 162 | Andrew Jergens | Cincinnati, OH | 1,229 | 53.6 | 670 | 242 |
| 163 | DPI Halperin | Baltimore, MD | 1,221 | 53.8 | 588 | 266 |
| 164 | General Foods USA | Philadelphia, PA | 1,219 | 54.0 | 19,135 | 7 |
| 165 | Lewis Bear Co. | Pensacola, FL | 1,208 | 54.2 | 1,895 | 115 |
| 166 | Borden Foods, Inc. | Charlotte, NC | 1,201 | 54.4 | 1,829 | 121 |
| 167 | Crown Prince, Inc. | Los Angeles, CA | 1,201 | 54.6 | 558 | 275 |
| 168 | Farmers Rice Co. | Sausalito, CA | 1,199 | 54.8 | 1,080 | 183 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|---------------------|----------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 169 | Merico, Inc. | City of Industry, CA | 1,199 | 54.9 | 460 | 312 |
| 170 | Dromedary | Kinston, NC | 1,198 | 55.1 | 368 | 342 |
| 171 | Eveready Battery | Dallas, TX | 1,196 | 55.3 | 1,204 | 165 |
| 172 | Softsoap Enterprise | St. Paul, MN | 1,192 | 55.5 | 679 | 241 |
| 173 | N K Hurst Co. | Indianapolis, IN | 1,189 | 55.7 | 358 | 347 |
| 174 | Riviana Foods, Inc. | New Orleans, LA | 1,188 | 55.9 | 746 | 226 |
| 175 | Hygrade Food | Detroit, MI | 1,184 | 56.1 | 720 | 235 |
| 176 | First Brands Co. | Pittsburgh, PA | 1,180 | 56.3 | 2,457 | 93 |
| 177 | Colgate Palmolive | Charlotte, NC | 1,178 | 56.5 | 7,133 | 31 |
| 178 | Chun King Corp. | Kinston, NC | 1,176 | 56.6 | 365 | 344 |
| 179 | Sioux Honey Assoc. | Minneapolis, MN | 1,174 | 56.8 | 353 | 349 |
| 180 | Golden Valley | Minneapolis, MN | 1,170 | 57.0 | 251 | 412 |
| 181 | Bertolli USA, Inc. | Newark, NJ | 1,167 | 57.2 | 635 | 249 |
| 182 | Smithfield Pkg. | Smithfield, VA | 1,167 | 57.4 | 1,733 | 124 |
| 183 | Mr. Coffee, Inc. | Detroit, MI | 1,166 | 57.6 | 153 | 503 |
| 184 | Bryan Foods, Inc. | Birmingham, AL | 1,165 | 57.8 | 1,861 | 117 |
| 185 | Lever Brothers | Dallas, TX | 1,146 | 57.9 | 10,807 | 16 |
| 186 | Sunkist Growers | Atlanta, GA | 1,142 | 58.1 | 494 | 296 |
| 187 | American Foods | Sausalito, CA | 1,141 | 58.3 | 693 | 238 |
| 188 | Weyerhaeuser Co. | Charlotte, NC | 1,135 | 58.5 | 1,947 | 111 |
| 189 | WM Wrigley Jr. | Charlotte, NC | 1,133 | 58.7 | 1,085 | 182 |
| 190 | Lancaster Food | Fairfax, VA | 1,132 | 58.9 | 1,732 | 125 |
| 191 | Golden Cat | Chicago, IL | 1,128 | 59.0 | 769 | 218 |
| 192 | Tombstone Pizza | Charlotte, NC | 1,127 | 59.2 | 1,011 | 182 |
| 193 | Block Drug Co. | Waipahu, HI | 1,115 | 59.4 | 1,183 | 171 |
| 194 | Borden Pasta Group | Chicago, IL | 1,102 | 59.6 | 467 | 306 |
| 195 | John Morrell | Columbus, OH | 1,094 | 59.7 | 1,861 | 118 |
| 196 | Stinson Seafood | Dallas, TX | 1,089 | 59.9 | 220 | 441 |
| 197 | O'Donnell | Tampa, FL | 1,088 | 60.1 | 547 | 279 |
| 198 | Continental Baking | Los Angeles, CA | 1,087 | 60.3 | 1,529 | 140 |
| 199 | Lea And Perrins | Newark, NJ | 1,087 | 60.4 | 216 | 443 |
| 200 | Galletti Brothers | Los Angeles, CA | 1,078 | 60.6 | 937 | 200 |
| 201 | Helene Curtis, Inc. | Chicago, IL | 1,078 | 60.8 | 1,558 | 138 |
| 202 | Tetley, Inc. | Pittsburgh, PA | 1,068 | 60.9 | 601 | 261 |
| 203 | McIlhenny Co. | New Orleans, LA | 1,067 | 61.1 | 178 | 481 |
| 204 | Chesebrough-Ponds | Charlotte, NC | 1,052 | 61.3 | 3,533 | 71 |
| 205 | Dannon | Philadelphia, PA | 1,048 | 61.5 | 669 | 244 |
| 206 | Lykes Brothers | Plant City, FL | 1,047 | 61.6 | 1,192 | 169 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|---------------------|-------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 207 | Leaf, Inc. | Atlanta, GA | 1,031 | 61.8 | 575 | 269 |
| 208 | Sweetheart Cup | Dallas, TX | 1,024 | 61.9 | 476 | 302 |
| 209 | Sterling Health | Atlanta, GA | 1,011 | 62.1 | 735 | 231 |
| 210 | Cornstock Michigan | Charlotte, NC | 999 | 62.3 | 328 | 360 |
| 211 | Mennen Company | Charlotte, NC | 986 | 62.4 | 1,270 | 158 |
| 212 | Wyeth Ayerst Labs | Dallas, TX | 985 | 62.6 | 771 | 217 |
| 213 | Odoms Tennessee | Madison, TN | 978 | 62.7 | 388 | 334 |
| 214 | Bruce Foods Corp. | Charlotte, NC | 973 | 62.9 | 181 | 477 |
| 215 | Entenmanns, Inc. | Los Angeles, CA | 970 | 63.0 | 2,743 | 84 |
| 216 | McKee Baking Co. | Collegedale, TN | 954 | 63.2 | 1,347 | 153 |
| 217 | Sara Lee Corp. | Chicago, IL | 954 | 63.3 | 560 | 272 |
| 218 | Goodmark Foods | Charlotte, NC | 953 | 63.5 | 259 | 410 |
| 219 | Revlon Commissary | New York, NY | 952 | 63.7 | 212 | 449 |
| 220 | Bausch & Lomb, Inc. | Atlanta, GA | 949 | 63.8 | 598 | 263 |
| 221 | Upjohn Co. | Chicago, IL | 949 | 64.0 | 463 | 308 |
| 222 | Curtice Burns | Denver, CO | 948 | 64.1 | 289 | 389 |
| 223 | Gwaltney Smithfield | Smithfield, VA | 944 | 64.3 | 890 | 205 |
| 224 | Diamond Brands | Minneapolis, MN | 931 | 64.4 | 108 | 552 |
| 225 | Sabatasso Foods | Santa Ana, CA | 920 | 64.6 | 427 | 323 |
| 226 | Wilson Foods Co. | Pittsburgh, PA | 915 | 64.7 | 1,193 | 188 |
| 227 | Tambrands | Atlanta, GA | 912 | 64.8 | 807 | 213 |
| 228 | Archway Cookies | Kalamazoo, MI | 904 | 65.0 | 528 | 284 |
| 229 | Pompeian | Baltimore, MD | 896 | 65.1 | 176 | 482 |
| 230 | Larsen Co. | Chicago, IL | 893 | 65.3 | 94 | 577 |
| 231 | A. H. Robins Co. | Ewa Beach, HI | 892 | 65.4 | 670 | 243 |
| 232 | Continental Baking | Denver, CO | 886 | 65.6 | 740 | 227 |
| 233 | Oral B Laboratories | Atlanta, GA | 870 | 65.7 | 640 | 247 |
| 234 | Dairy Rich, Inc. | San Antonio, TX | 858 | 65.8 | 232 | 428 |
| 235 | Mario Olive | Omaha, NE | 857 | 66.0 | 318 | 371 |
| 236 | Powers Candy | Spokane, WA | 855 | 66.1 | 1,118 | 178 |
| 237 | M. Polaner B. | Newark, NJ | 849 | 66.2 | 290 | 387 |
| 238 | Dannon Co. | Philadelphia, PA | 845 | 66.4 | 852 | 210 |
| 239 | Lorillard Tobacco | New York, NY | 838 | 66.5 | 4,228 | 59 |
| 240 | American Vitamins | Tempe, AZ | 832 | 66.6 | 980 | 197 |
| 241 | Dairy Maid Dairy | Baltimore, MD | 832 | 66.8 | 752 | 224 |
| 242 | Fort Howard Corp. | Dallas, TX | 832 | 66.9 | 425 | 324 |
| 243 | Safeway, Inc. | San Francisco, CA | 832 | 67.0 | 1,752 | 123 |
| 244 | Jel Sert Co. | West Chicago, IL | 830 | 67.2 | 229 | 432 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|-----------------------|----------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 245 | Curtice Burns | Seattle, WA | 826 | 67.3 | 1,016 | 191 |
| 246 | Smiths Bakery | Mobile, AL | 815 | 67.4 | 246 | 416 |
| 247 | Dairy Fresh | Los Angeles, CA | 809 | 67.6 | 731 | 234 |
| 248 | Bumble Bee Seafood | Charlotte, NC | 807 | 67.7 | 455 | 313 |
| 249 | Gandys Dairies | San Angelo, TX | 796 | 67.8 | 213 | 448 |
| 250 | Luiginos, Inc. | Carol Stream, IL | 794 | 67.9 | 271 | 402 |
| 251 | Knouse Foods | Philadelphia, PA | 793 | 68.1 | 176 | 483 |
| 252 | Royal Oak | Chicago, IL | 783 | 68.2 | 269 | 403 |
| 253 | Bic Corporation | Newark, NJ | 777 | 68.3 | 206 | 456 |
| 254 | Erly Juice, Inc. | Houston, TX | 767 | 68.4 | 159 | 498 |
| 255 | Austin Foods Co. | Atlanta, GA | 763 | 68.6 | 260 | 409 |
| 256 | Allen Canning | Siloam Springs, AR | 762 | 68.7 | 266 | 405 |
| 257 | Sinton Dairy | Colorado Springs, CO | 762 | 68.8 | 511 | 288 |
| 258 | Chatterm Consolidated | Atlanta, GA | 759 | 68.9 | 157 | 500 |
| 259 | G T E Products | Honolulu, HI | 759 | 69.1 | 518 | 287 |
| 260 | Armor All Products | Los Angeles, CA | 754 | 69.2 | 167 | 490 |
| 261 | Celestial Seasons | Denver, CO | 753 | 69.3 | 77 | 609 |
| 262 | Flowers Baking | El Paso, TX | 752 | 69.4 | 1,080 | 184 |
| 263 | Marcac Paper | Pittsburgh, PA | 749 | 69.5 | 325 | 363 |
| 264 | Military Dist. | Atlanta, GA | 749 | 69.6 | 608 | 256 |
| 265 | Carlisle Plastics | Minneapolis, MN | 745 | 69.8 | 234 | 423 |
| 266 | Super Valu Stores | Spokane, WA | 744 | 69.9 | 1,270 | 159 |
| 267 | Ragu Foods, Inc. | Charlotte, NC | 727 | 70.0 | 2,667 | 89 |
| 268 | Art Dykstra | Englewood, CO | 717 | 70.1 | 879 | 206 |
| 269 | Sarvis, Inc. | Jacksonville, FL | 699 | 70.2 | 346 | 351 |
| 270 | Jack and Jill, Inc. | Baltimore, MD | 697 | 70.3 | 462 | 310 |
| 271 | Carter Products | Honolulu, HI | 696 | 70.4 | 479 | 301 |
| 272 | Eurpac Service | Virginia Beach, VA | 685 | 70.6 | 1,037 | 187 |
| 273 | Lederle Labs | Pasadena, CA | 684 | 70.7 | 591 | 265 |
| 274 | Kiwi Brands, Inc. | Philadelphia, PA | 680 | 70.8 | 135 | 516 |
| 275 | Shasta Beverage | Dallas, TX | 678 | 70.9 | 794 | 215 |
| 276 | Dowbrands, Inc. | Minneapolis, MN | 676 | 71.0 | 133 | 519 |
| 277 | Haagen Dazs | Pasadena, CA | 667 | 71.1 | 288 | 390 |
| 278 | Sunshine Makers | Honolulu, HI | 659 | 71.2 | 152 | 507 |
| 279 | No Nonsense | Charlotte, NC | 649 | 71.3 | 384 | 336 |
| 280 | Wetterau Quincy | Quincy, FL | 639 | 71.4 | 1,367 | 151 |
| 281 | S. B. Thomas, Inc. | Newark, NJ | 635 | 71.5 | 642 | 246 |
| 282 | P. Leiner | Detroit, MI | 626 | 71.6 | 1,018 | 189 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|----------------------|--------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 283 | Prairie Farms | Peoria, IL | 622 | 71.7 | 322 | 369 |
| 284 | Coburg Dairy, Inc. | N. Charleston, SC | 619 | 71.8 | 555 | 276 |
| 285 | King Seafoods, Inc. | Kinston, NC | 611 | 71.9 | 112 | 546 |
| 286 | Dep Corporation | Pittsburgh, PA | 602 | 72.0 | 94 | 578 |
| 287 | Velda Farms, Inc. | Tampa, FL | 597 | 72.1 | 383 | 337 |
| 288 | Reese Brokerage | Nashville, TN | 591 | 72.2 | 422 | 326 |
| 289 | Consolidated | Pittsburgh, PA | 581 | 72.3 | 380 | 338 |
| 290 | Monfort, Inc. | Billings, MT | 581 | 72.4 | 1,440 | 145 |
| 291 | Durkee French | Kinston, NC | 572 | 72.5 | 436 | 319 |
| 292 | Loreal | Chicago, IL | 567 | 72.6 | 230 | 431 |
| 293 | Bil Mar Foods, Inc. | Chicago, IL | 562 | 72.6 | 298 | 384 |
| 294 | Pinkerton Tobacco | Atlanta, GA | 561 | 72.7 | 466 | 307 |
| 295 | T. W. Garner Food | Charlotte, NC | 560 | 72.8 | 103 | 563 |
| 296 | Holly Farms Foods | Columbia, SC | 556 | 72.9 | 1,236 | 163 |
| 297 | Ball Corporation | Denver, CO | 550 | 73.0 | 227 | 437 |
| 298 | Ramfield and Co. | Honolulu, HI | 550 | 73.1 | 134 | 518 |
| 299 | Townleys Dairy | Oklahoma City, OK | 550 | 73.2 | 233 | 427 |
| 300 | Granny Goose | Honolulu, HI | 547 | 73.3 | 533 | 283 |
| 301 | Golden Flake | Birmingham, AL | 546 | 73.3 | 353 | 350 |
| 302 | H. P. Hood, Inc. | Boston, MA | 545 | 73.4 | 502 | 291 |
| 303 | Ruiz Food Products | St. Louis, MO | 540 | 73.5 | 111 | 547 |
| 304 | Plains Creamery | Amarillo, TX | 531 | 73.6 | 596 | 264 |
| 305 | Keyes Fibre Co. | Kinston, NC | 530 | 73.7 | 98 | 571 |
| 306 | Hershey Refrigerated | Atlanta, GA | 525 | 73.8 | 79 | 605 |
| 307 | Idaho Fresh | Lewisville, ID | 525 | 73.9 | 59 | 633 |
| 308 | C and W Frozen Food | San Francisco, CA | 519 | 73.9 | 127 | 526 |
| 309 | Valley Foodservice | Norfolk, VA | 516 | 74.0 | 624 | 253 |
| 310 | Hanover Foods Co. | Philadelphia, PA | 514 | 74.1 | 166 | 491 |
| 311 | White Dairy Co. | Fort Smith, AR | 514 | 74.2 | 297 | 386 |
| 312 | MC Retail Foods | New York, NY | 511 | 74.3 | 228 | 435 |
| 313 | National Beef | Fort Worth, TX | 511 | 74.3 | 10,320 | 17 |
| 314 | Nearby Eggs, Inc. | Ft. Lauderdale, FL | 510 | 74.4 | 485 | 298 |
| 315 | Gold Kist Poultry | Live Oak, FL | 507 | 74.5 | 835 | 211 |
| 316 | Adohr Farms, Inc. | Los Angeles, CA | 506 | 74.6 | 496 | 294 |
| 317 | Boyer Gourmet | Denver, CO | 506 | 74.7 | 547 | 280 |
| 318 | McKee Foods Corp. | Collegedale, TN | 505 | 74.8 | 738 | 229 |
| 319 | Mothers Cake | Honolulu, HI | 500 | 74.8 | 876 | 208 |
| 320 | Quality Meat Pkg. | Los Angeles, CA | 499 | 74.9 | 2,378 | 96 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|------------------------|--------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 321 | Continental Mills | Seattle, WA | 498 | 75.0 | 126 | 527 |
| 322 | Fromageries | Fort Lee, NJ | 496 | 75.1 | 107 | 553 |
| 323 | Halperin Dist. | Baltimore, MD | 496 | 75.1 | 256 | 411 |
| 324 | Ferrero USA, Inc. | Newark, NJ | 495 | 75.2 | 139 | 512 |
| 325 | Palmetto Baking | Orangeburg, SC | 494 | 75.3 | 405 | 330 |
| 326 | GFA Brands | Cresskill, NJ | 492 | 75.4 | 44 | 654 |
| 327 | United Shellfish | Grasonville, MD | 490 | 75.5 | 602 | 260 |
| 328 | Bob Evans Farms | Columbus, OH | 489 | 75.5 | 246 | 417 |
| 329 | Marion Merrell | Cincinnati, OH | 488 | 75.6 | 186 | 471 |
| 330 | Kelloggs Sales | Dallas, TX | 482 | 75.7 | 4,736 | 52 |
| 331 | Sara Lee Bakery | Chicago, IL | 480 | 75.8 | 202 | 459 |
| 332 | Continental Baking | Charlotte, NC | 479 | 75.8 | 1,279 | 157 |
| 333 | Melitta USA, Inc. | Philadelphia, PA | 478 | 75.9 | 120 | 537 |
| 334 | Tidewater Wholesale | Chesapeake, VA | 478 | 76.0 | 935 | 201 |
| 335 | Steffen Dairy | Wichita, KS | 474 | 76.1 | 24 | 419 |
| 336 | Santee Dairies | Los Angeles, CA | 471 | 76.2 | 497 | 293 |
| 337 | Peninsula Cream | Palo Alto, CA | 468 | 76.2 | 316 | 374 |
| 338 | Crystal Cream | Sacramento, CA | 465 | 76.3 | 764 | 221 |
| 339 | Rayovac Corp. | Charlotte, NC | 459 | 76.4 | 229 | 433 |
| 340 | Lovette Co. | Charlotte, NC | 456 | 76.4 | 977 | 198 |
| 341 | Sandoz Consumer | Atlanta, GA | 454 | 76.5 | 142 | 511 |
| 342 | Martha White | Nashville, TN | 451 | 76.6 | 377 | 339 |
| 343 | Pfizer Consumer | Honolulu, HI | 450 | 76.7 | 683 | 240 |
| 344 | S and W Fine Food | Seattle, WA | 446 | 76.7 | 364 | 345 |
| 345 | C C S Dist. | Landover, MD | 445 | 76.8 | 1,381 | 150 |
| 346 | Metz Baking Co. | Salt Lake City, UT | 443 | 76.9 | 307 | 379 |
| 347 | Mariani Pkg. Co. | San Jose, CA | 442 | 76.9 | 147 | 509 |
| 348 | Gourmet | San Francisco, CA | 434 | 77.0 | 431 | 321 |
| 349 | Alcon Laboratory | Fort Worth, TX | 433 | 77.1 | 402 | 331 |
| 350 | Kraft Food Ingredients | Dallas, TX | 430 | 77.2 | 186 | 472 |
| 351 | R. P. Rorer | Charlotte, NC | 429 | 77.2 | 186 | 473 |
| 352 | Forster Mfg. | Wilton, ME | 428 | 77.3 | 58 | 636 |
| 353 | VMG Enterprises | Portland, OR | 423 | 77.4 | 779 | 216 |
| 354 | Smiths Food | Layton, UT | 420 | 77.4 | 409 | 328 |
| 355 | Riceland Foods | St. Louis, MO | 419 | 77.5 | 80 | 600 |
| 356 | Sunnyland Foods | Atlanta, GA | 419 | 77.6 | 716 | 236 |
| 357 | Mrs. Strattons | Birmingham, AL | 417 | 77.6 | 83 | 592 |
| 358 | Darigold, Inc. | Boise, ID | 416 | 77.7 | 263 | 407 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|--------------------|--------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 359 | Innova Pure | Clearwater, FL | 416 | 77.8 | 72 | 614 |
| 360 | Shasta Sales | Dallas, TX | 412 | 77.8 | 473 | 304 |
| 361 | Bouyea Fassetts | S. Burlington, VT | 411 | 77.9 | 138 | 514 |
| 362 | Coca Cola | Atlanta, GA | 410 | 78.0 | 31 | 673 |
| 363 | Vernells Fine | Chicago, IL | 409 | 78.0 | 91 | 584 |
| 364 | CI Seafoods, Inc. | Seattle, WA | 402 | 78.1 | 133 | 520 |
| 365 | Swisher Intl. | Birmingham, AL | 402 | 78.1 | 191 | 467 |
| 366 | Goya Foods, Inc. | Salt Lake City, UT | 401 | 78.2 | 324 | 364 |
| 367 | Millstone Coffee | Seattle, WA | 401 | 78.3 | 560 | 273 |
| 368 | Green Spring | Baltimore, MD | 398 | 78.3 | 316 | 375 |
| 369 | Carter Wallace | Palatine, IL | 391 | 78.4 | 251 | 413 |
| 370 | Ameriplus, Inc. | Oldsmar, FL | 388 | 78.5 | 58 | 637 |
| 371 | Eagle Snacks | San Diego, CA | 387 | 78.5 | 407 | 329 |
| 372 | Med Diet Labs | Plymouth, MN | 387 | 78.6 | 272 | 399 |
| 373 | T. Marzetti Co. | Columbus, OH | 386 | 78.6 | 60 | 631 |
| 374 | Kenosha Beef, Inc. | Milwaukee, WI | 383 | 78.7 | 2,783 | 83 |
| 375 | Borden Snacks | Kansas City, MO | 382 | 78.8 | 175 | 485 |
| 376 | White Cap, Inc. | Philadelphia, PA | 381 | 78.8 | 41 | 655 |
| 377 | Distributive | Portland, OR | 379 | 78.9 | 441 | 317 |
| 378 | Flav O Rich, Inc. | Atlanta, GA | 379 | 78.9 | 432 | 320 |
| 379 | Butterkrust Baking | Lakeland, FL | 377 | 79.0 | 106 | 557 |
| 380 | Lone Star, Inc. | San Antonio, TX | 376 | 79.1 | 126 | 528 |
| 381 | Scrivner, Inc. | Oklahoma City, OK | 368 | 79.1 | 758 | 223 |
| 382 | Mrs. Bairds Bake | Lubbock, TX | 362 | 79.2 | 490 | 297 |
| 383 | Colonial Baking | Macon, GA | 361 | 79.2 | 1,141 | 175 |
| 384 | Kinnett Dairies | Columbus, GA | 361 | 79.3 | 441 | 318 |
| 385 | Natural Vitamin | South El Monte, CA | 361 | 79.4 | 264 | 406 |
| 386 | Greenwood Pkg. | Greenwood, SC | 360 | 79.4 | 430 | 322 |
| 387 | Rocky Mountain | Las Vegas, NV | 360 | 79.5 | 153 | 504 |
| 388 | National Fruit | Winchester, VA | 359 | 79.5 | 129 | 523 |
| 389 | Regis Milk Co. | Charleston, SC | 359 | 79.6 | 366 | 343 |
| 390 | Toms Foods, Inc. | Atlanta, GA | 359 | 79.6 | 229 | 434 |
| 391 | Kraft Food Service | Seattle, WA | 356 | 79.7 | 402 | 332 |
| 392 | Bridgford Foods | Anaheim, CA | 354 | 79.8 | 163 | 493 |
| 393 | Tootsie Roll, Inc. | Chicago, IL | 354 | 79.8 | 565 | 270 |
| 394 | Affiliated | Tampa, FL | 352 | 79.9 | 370 | 341 |
| 395 | Winterhill Frozen | Boston, MA | 351 | 79.9 | 463 | 309 |
| 396 | Burroughs Wellcome | Charlotte, NC | 349 | 80.0 | 550 | 278 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|--------------------|--------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 397 | Corwood Co. | Memphis, TN | 349 | 80.0 | 290 | 388 |
| 398 | Jones Dairy Farms | Fort Atkinson, WI | 349 | 80.1 | 122 | 536 |
| 399 | Vita Pakt Citrus | Covina, CA | 349 | 80.1 | 118 | 540 |
| 400 | Castleberry's | Atlanta, GA | 347 | 80.2 | 58 | 638 |
| 401 | Southern Dairy | Richmond, VA | 347 | 80.3 | 386 | 335 |
| 402 | Purity Baking Co. | Decatur, IL | 346 | 80.3 | 55 | 647 |
| 403 | Continental Baking | St. Louis, MO | 345 | 80.4 | 503 | 290 |
| 404 | Borden Foods | Chicago, IL | 344 | 80.4 | 618 | 255 |
| 405 | Dreyers Grand | Los Angeles, CA | 342 | 80.5 | 1,004 | 193 |
| 406 | Northeast Military | Gardner, MA | 341 | 80.5 | 355 | 348 |
| 407 | Johnson Bros. | San Jose, CA | 340 | 80.6 | 218 | 442 |
| 408 | Dairymen, Inc. | Charlotte, NC | 338 | 80.6 | 102 | 565 |
| 409 | King Nut Co. | Solon, OH | 335 | 80.7 | 203 | 458 |
| 410 | Krispy Kreme | Macon, GA | 335 | 80.7 | 286 | 391 |
| 411 | Murray Biscuit | Atlanta, GA | 335 | 80.8 | 318 | 372 |
| 412 | W and H Voortman | Buffalo, NY | 334 | 80.9 | 124 | 530 |
| 413 | Triple T Meat | Tampa, FL | 333 | 80.9 | 390 | 333 |
| 414 | Baumer Foods | New Orleans, LA | 332 | 81.0 | 146 | 510 |
| 415 | Gunnoe Sausage | Goode, VA | 332 | 81.0 | 191 | 468 |
| 416 | Roswell Baking | Roswell, NM | 330 | 81.1 | 118 | 541 |
| 417 | Nash Finch Co. | Lincoln, NE | 329 | 81.1 | 346 | 352 |
| 418 | Metropolitan | Landover, MD | 325 | 81.2 | 810 | 212 |
| 419 | C and S Wholesale | Brattleboro, VT | 323 | 81.2 | 446 | 316 |
| 420 | Cream O Weber | Salt Lake City, UT | 322 | 81.3 | 215 | 445 |
| 421 | Perfection Bakery | Fort Wayne, IN | 322 | 81.3 | 62 | 625 |
| 422 | Stella D. Oro | San Leandro, CA | 322 | 81.4 | 92 | 582 |
| 423 | Newmans Own, Inc. | Westport, CT | 321 | 81.4 | 69 | 618 |
| 424 | Eagle Crest Food | Dallas, TX | 320 | 81.5 | 57 | 639 |
| 425 | Grants Dairy, Inc. | Bangor, ME | 320 | 81.5 | 124 | 531 |
| 426 | Real Fresh, Inc. | Los Angeles, CA | 319 | 81.6 | 73 | 612 |
| 427 | California | San Francisco, CA | 318 | 81.6 | 324 | 365 |
| 428 | Hollandia Dairy | San Marcos, CA | 318 | 81.7 | 803 | 214 |
| 429 | Lusamerica Food | San Jose, CA | 318 | 81.7 | 211 | 452 |
| 430 | Oregon Fruit | Salem, OR | 317 | 81.8 | 45 | 653 |
| 431 | Skinners Dairy | Jacksonville, FL | 317 | 81.8 | 687 | 239 |
| 432 | Continental Baking | Seattle, WA | 316 | 81.9 | 1,141 | 176 |
| 433 | Macayo Mexican | Phoenix, AZ | 313 | 81.9 | 57 | 640 |
| 434 | Sun Land Beef Co. | El Monte, CA | 313 | 82.0 | 3,300 | 77 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|----------------------|---------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 435 | Royal Foods Dist. | Woodbridge, NJ | 311 | 82.0 | 280 | 394 |
| 436 | Zacky Foods | Los Angeles, CA | 310 | 82.1 | 475 | 303 |
| 437 | Mt. Olive Pickle | Charlotte, NC | 305 | 82.1 | 179 | 479 |
| 438 | Otis Spunkmeyer | San Leandro, CA | 303 | 82.2 | 169 | 488 |
| 439 | Suntory Water | Atlanta, GA | 300 | 82.2 | 46 | 652 |
| 440 | Kreamo Bakers | South Bend, IN | 299 | 82.3 | 14 | 695 |
| 441 | LePage Bakeries | Auburn, ME | 299 | 82.3 | 36 | 663 |
| 442 | Robinson Dairy | Denver, CO | 299 | 82.4 | 337 | 358 |
| 443 | Fircrest Farms | Creswell, OR | 296 | 82.4 | 480 | 300 |
| 444 | Mapelli Brother | Greeley, CO | 296 | 82.5 | 1,244 | 162 |
| 445 | Pan O Gold Baking | Fargo, ND | 295 | 82.5 | 80 | 601 |
| 446 | Saffola Quality | Los Angeles, CA | 295 | 82.6 | 28 | 676 |
| 447 | Hudson Foods, Inc. | Rogers, AR | 292 | 82.6 | 733 | 232 |
| 448 | A & M Pet Products | Houston, TX | 290 | 82.6 | 95 | 576 |
| 449 | Night Hawk | Austin, TX | 289 | 82.7 | 183 | 476 |
| 450 | Wayne Dairy Products | Richmond, IN | 289 | 82.7 | 214 | 447 |
| 451 | Bell Dairy Products | Lubbock, TX | 288 | 82.8 | 54 | 649 |
| 452 | Critzas Industries | St. Louis, MO | 287 | 82.8 | 9 | 700 |
| 453 | Jordon Sausage | Columbus, GA | 284 | 82.9 | 304 | 381 |
| 454 | Silver Sea Sale | Baltimore, MD | 284 | 82.9 | 309 | 377 |
| 455 | LePage Bakeries | Auburn, MA | 282 | 83.0 | 36 | 664 |
| 456 | Spontex, Inc. | Nashville, TN | 281 | 83.0 | 13 | 697 |
| 457 | Tony Ingoglia | West Sacramento, CA | 281 | 83.1 | 714 | 237 |
| 458 | Clark Brothers | Salisbury, MD | 279 | 83.1 | 163 | 494 |
| 459 | National Vitamin | Porterville, CA | 279 | 83.1 | 340 | 356 |
| 460 | Bill Baileys | Downey, CA | 277 | 83.2 | 240 | 420 |
| 461 | Foremost Dairies | Honolulu, HI | 277 | 83.2 | 1,132 | 177 |
| 462 | B. Green and Co. | Baltimore, MD | 275 | 83.3 | 603 | 259 |
| 463 | Prime Natural | Carson, CA | 274 | 83.3 | 234 | 424 |
| 464 | Owens Country | Richardson, TX | 273 | 83.4 | 205 | 457 |
| 465 | Chock Full O Nuts | New York, NY | 271 | 83.4 | 91 | 585 |
| 466 | General Foods Co. | Philadelphia, PA | 271 | 83.5 | 4,327 | 57 |
| 467 | IBP, Inc. | Pittsburgh, PA | 269 | 83.5 | 4,947 | 50 |
| 468 | Comet Rice, Inc. | Pasadena, CA | 267 | 83.5 | 96 | 575 |
| 469 | California | San Francisco, CA | 266 | 83.6 | 1,233 | 164 |
| 470 | Carr Gottstein | Anchorage, AK | 266 | 83.6 | 360 | 346 |
| 471 | Edys Grand Ice | Philadelphia, PA | 265 | 83.7 | 502 | 292 |
| 472 | Rampart Markets | Scottsdale, AZ | 264 | 83.7 | 202 | 460 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|---------------------|----------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 473 | Sam Kane Beef | Corpus Christi, TX | 264 | 83.7 | 3,095 | 79 |
| 474 | Mission Foods Co. | Los Angeles, CA | 263 | 83.8 | 161 | 495 |
| 475 | Valley Virginia | Springfield, VA | 262 | 83.8 | 207 | 454 |
| 476 | Nevada Baking Co. | Las Vegas, NV | 260 | 83.9 | 71 | 616 |
| 477 | Sandoz Nutrition | Chicago, IL | 260 | 83.9 | 71 | 617 |
| 478 | Arnold Foods | Charlotte, NC | 257 | 84.0 | 341 | 355 |
| 479 | Anderson Ericks | Des Moines, IA | 255 | 84.0 | 298 | 385 |
| 480 | La Victoria Foods | City of Industry, CA | 253 | 84.0 | 72 | 615 |
| 481 | Thompson Medica | Honolulu, HI | 253 | 84.1 | 129 | 524 |
| 482 | Combe, Inc. | St. Louis, MO | 252 | 84.1 | 111 | 548 |
| 483 | Ciba Consumer | Charlotte, NC | 250 | 84.2 | 75 | 611 |
| 484 | Neutrogena Corp. | Los Angeles, CA | 250 | 84.2 | 153 | 505 |
| 485 | F and L Enterprises | Los Angeles, CA | 249 | 84.2 | 228 | 436 |
| 486 | Shoenberg Farms | Arvada, CO | 249 | 84.3 | 56 | 643 |
| 487 | Camino Real Food | Vernon, CA | 246 | 84.3 | 16 | 692 |
| 488 | Camation Dairy | Phoenix, AZ | 246 | 84.4 | 268 | 404 |
| 489 | Savannah Foods | Atlanta, GA | 246 | 84.4 | 588 | 267 |
| 490 | Rondo Specialty | Toronto, Ontario | 245 | 84.4 | 324 | 366 |
| 491 | Stephens Meat | San Jose, CA | 245 | 84.5 | 181 | 478 |
| 492 | Rocky Road | Waimanalo, HI | 244 | 84.5 | 187 | 469 |
| 493 | Neuman Dist. Co. | San Antonio, TX | 243 | 84.5 | 212 | 450 |
| 494 | F D L Marketing | Chicago, IL | 242 | 84.6 | 559 | 274 |
| 495 | Charles F. Cates | Baltimore, MD | 240 | 84.6 | 107 | 554 |
| 496 | Gold Bond Good | Chicago, IL | 240 | 84.7 | 80 | 602 |
| 497 | Mem Co., Inc. | Newark, NJ | 239 | 84.7 | 57 | 641 |
| 498 | Svenhards | Oakland, CA | 239 | 84.7 | 280 | 395 |
| 499 | Palama Meat Co. | Honolulu, HI | 238 | 84.8 | 2,101 | 107 |
| 500 | Northern Fish | Tacoma, WA | 236 | 84.8 | 300 | 383 |
| 501 | Sweeney and Co. | San Antonio, TX | 235 | 84.9 | 462 | 311 |
| 502 | Boston Beef Food | Boston, MA | 234 | 84.9 | 1,420 | 146 |
| 503 | Lorillard Tobacco | New York, NY | 234 | 84.9 | 1,004 | 194 |
| 504 | Rudys Farm Co. | Charlotte, NC | 232 | 85.0 | 105 | 559 |
| 505 | Blistex, Inc. | Oak Brook, IL | 228 | 85.0 | 106 | 558 |
| 506 | Martins Famous | Chambersburg, PA | 228 | 85.0 | 187 | 470 |
| 507 | Mountain State | Denver, CO | 228 | 85.1 | 83 | 593 |
| 508 | C. B. Fleet Co. | Lynchburg, VA | 226 | 85.1 | 27 | 678 |
| 509 | Veryfine Products | Woburn, MA | 226 | 85.1 | 73 | 613 |
| 510 | Haddon House Foods | Medford, NJ | 225 | 85.2 | 496 | 295 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|---------------------|---------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 511 | Hershey Meats | Hershey Dauphin, PA | 225 | 85.2 | 328 | 361 |
| 512 | Burlesons, Inc. | Waxahachie, TX | 220 | 85.3 | 32 | 672 |
| 513 | Byrne Dairy, Inc. | Syracuse, NY | 219 | 85.3 | 90 | 586 |
| 514 | Hub Foods Dist. | Fairbanks, AK | 219 | 85.3 | 423 | 325 |
| 515 | Prices Creameries | El Paso, TX | 219 | 85.4 | 148 | 508 |
| 516 | Standard Meat Co. | San Diego, CA | 218 | 85.4 | 324 | 367 |
| 517 | Hawaiian Sun | Honolulu, HI | 217 | 85.4 | 212 | 451 |
| 518 | Spreckles Sugar | San Francisco, CA | 217 | 85.5 | 629 | 251 |
| 519 | Coca Cola Bottling | San Francisco, CA | 215 | 85.5 | 2,303 | 97 |
| 520 | Linford of Alaska | Anchorage, AK | 215 | 85.5 | 166 | 492 |
| 521 | Coles Quality | Muskegon, MI | 214 | 85.6 | 31 | 674 |
| 522 | Parks Sausage Co. | Baltimore, MD | 214 | 85.6 | 56 | 644 |
| 523 | Blue Bell Creamery | Houston, TX | 213 | 85.6 | 765 | 220 |
| 524 | Heluva Good Cheese | Chesapeake, VA | 210 | 85.7 | 138 | 515 |
| 525 | Dispenser Service | Dallas, TX | 208 | 85.7 | 189 | 462 |
| 526 | Lombardi Food | McLean, VA | 208 | 85.7 | 281 | 393 |
| 527 | Snyders of Hanover | Hanover, PA | 207 | 85.8 | 234 | 425 |
| 528 | Country Crisp | Salt Lake City, UT | 206 | 85.8 | 49 | 651 |
| 529 | Hickory Special | Nashville, TN | 203 | 85.8 | 61 | 627 |
| 530 | Bristol Myers | Princeton, NJ | 202 | 85.9 | 64 | 620 |
| 531 | Lakeside Dairy | Sioux Falls, SD | 201 | 85.9 | 107 | 555 |
| 532 | Embly Ranch | El Cajon, CA | 200 | 85.9 | 239 | 421 |
| 533 | Arnold Foods | Newark, NJ | 199 | 86.0 | 318 | 373 |
| 534 | Aponte and Clay | Shippensburg, PA | 196 | 86.0 | 37 | 662 |
| 535 | National Tobacco | Louisville, KY | 196 | 86.0 | 109 | 550 |
| 536 | Holly Farms | Dallas, TX | 195 | 86.1 | 332 | 359 |
| 537 | Anclote Seafood | Tarpon Springs, FL | 194 | 86.1 | 82 | 595 |
| 538 | Cloverdale Food | Mandan, ND | 194 | 86.1 | 198 | 464 |
| 539 | Marva Maid Dairy | Norfolk, VA | 194 | 86.1 | 661 | 245 |
| 540 | Randall Foods, Inc. | Huntington Park, CA | 193 | 86.2 | 117 | 543 |
| 541 | Utz Quality Foods | Hanover, PA | 191 | 86.2 | 282 | 392 |
| 542 | Sigman Meat Co. | Denver, CO | 190 | 86.2 | 93 | 580 |
| 543 | Millers Dairy | Norfolk, VA | 189 | 86.3 | 125 | 529 |
| 544 | Coca Cola USA | Atlanta, GA | 188 | 86.3 | 21 | 684 |
| 545 | Holsum Bakery | Phoenix, AZ | 187 | 86.3 | 227 | 438 |
| 546 | R. L. Zeigler | Selma, AL | 187 | 86.4 | 63 | 622 |
| 547 | Stroehmann Bakery | Norristown, PA | 185 | 86.4 | 174 | 486 |
| 548 | Gillette Dairy | Rapid City, SD | 184 | 86.4 | 246 | 418 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|---------------------|----------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 549 | Leonettis Frozen | Philadelphia, PA | 184 | 86.4 | 40 | 656 |
| 550 | Meadow Gold Dairy | Honolulu, HI | 184 | 86.5 | 737 | 230 |
| 551 | Fisons Consumer | New York, NY | 183 | 86.5 | 40 | 657 |
| 552 | James Austin Co. | Mars, PA | 182 | 86.5 | 21 | 685 |
| 553 | M and M Produce | San Antonio, TX | 182 | 86.6 | 302 | 382 |
| 554 | John J. Nissen | Portland, ME | 181 | 86.6 | 120 | 538 |
| 555 | Carlisle Poultry | Burgaw, NC | 180 | 86.6 | 159 | 499 |
| 556 | Claxton Poultry | Claxton, GA | 180 | 86.6 | 250 | 414 |
| 557 | Pepsi Cola Co. | Indianapolis, IN | 180 | 86.7 | 2,284 | 98 |
| 558 | Mid Atlantic Co. | Baltimore, MD | 179 | 86.7 | 2,724 | 85 |
| 559 | Producers Dairy | Fresno, CA | 179 | 86.7 | 275 | 397 |
| 560 | Specialty Food | Tampa, FL | 178 | 86.8 | 372 | 340 |
| 561 | Coles Pure Honey | Oakland, CA | 177 | 86.8 | 39 | 658 |
| 562 | Dandy Dist. | San Bernardino, CA | 177 | 86.8 | 169 | 489 |
| 563 | Tri State Dist. | Ozark, AL | 177 | 86.8 | 312 | 376 |
| 564 | Accord Company | Fairbanks, AK | 176 | 86.9 | 232 | 429 |
| 565 | Dandy Sales | San Bernardino, CA | 175 | 86.9 | 76 | 610 |
| 566 | Snyders Bakery | Spokane, WA | 175 | 87.0 | 83 | 594 |
| 567 | Northern Labs | Milwaukee, WI | 173 | 87.0 | 15 | 693 |
| 568 | Tanning Research | Daytona Beach, FL | 172 | 87.0 | 84 | 591 |
| 569 | Cotton Brothers | Alexandria, LA | 171 | 87.0 | 107 | 556 |
| 570 | Service Deli | San Diego, CA | 171 | 87.0 | 732 | 233 |
| 571 | Excel Mineral Co. | Goleta, CA | 170 | 87.1 | 89 | 587 |
| 572 | Ferry Bros. | Hillsboro, OR | 170 | 87.1 | 135 | 517 |
| 573 | Hawaiian Dist. | Pearl City, HI | 170 | 87.1 | 215 | 446 |
| 574 | Port Townsend | Seattle, WA | 170 | 87.1 | 25 | 682 |
| 575 | Acme Foods Sale | South Seattle, WA | 169 | 87.2 | 101 | 566 |
| 576 | Borden Superior | Austin, TX | 169 | 87.2 | 63 | 623 |
| 577 | Brock Candy Co. | Nashville, TN | 169 | 87.2 | 139 | 513 |
| 578 | Coca Cola Fountain | Atlanta, GA | 169 | 87.3 | 13 | 698 |
| 579 | Arrowhead Mtn. | Phoenix, AZ | 168 | 87.3 | 327 | 362 |
| 580 | Crowley Foods, Inc. | Binghamton, NY | 166 | 87.3 | 61 | 628 |
| 581 | D. B. Brown, Inc. | Philadelphia, PA | 166 | 87.3 | 224 | 440 |
| 582 | Pepsi Cola South | Dallas, TX | 166 | 87.4 | 1,252 | 160 |
| 583 | Hiland Dairy Co. | Springfield, MO | 165 | 87.4 | 216 | 444 |
| 584 | Nutri Bon Dist. | Santa Fe Springs, CA | 165 | 87.4 | 238 | 422 |
| 585 | Broadview Dairy | Spokane, WA | 164 | 87.4 | 226 | 439 |
| 586 | Blanco and Assoc. | Roswell, GA | 163 | 87.5 | 110 | 549 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|---------------------|----------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 587 | Farmers Dairies | El Paso, TX | 163 | 87.5 | 161 | 496 |
| 588 | Resers Fine Foods | Portland, OR | 163 | 87.5 | 105 | 560 |
| 589 | Country Classic | Bozeman, MT | 162 | 87.5 | 176 | 484 |
| 590 | Good Old Days | Little Rock, AR | 161 | 87.6 | 19 | 688 |
| 591 | McDonald Dairy | Flint, MI | 161 | 87.6 | 60 | 632 |
| 592 | Two Count Co. | San Francisco, CA | 161 | 87.6 | 118 | 542 |
| 593 | Conagra Frozen | Palatine, IL | 160 | 87.6 | 82 | 596 |
| 594 | Federal Food | Colorado Springs, CO | 160 | 87.7 | 93 | 581 |
| 595 | Ragold, Inc. | Chicago, IL | 160 | 87.7 | 24 | 683 |
| 596 | Tri Miller Pkg. | Columbus, OH | 160 | 87.7 | 599 | 262 |
| 597 | Beiersdorf | Philadelphia, PA | 159 | 87.7 | 92 | 583 |
| 598 | Excel Refrigeration | Kent, WA | 159 | 87.8 | 88 | 589 |
| 599 | Thomas Frozen | Patterson, NJ | 159 | 87.8 | 26 | 680 |
| 600 | Benham and Co. | Denver, CO | 158 | 87.8 | 56 | 645 |
| 601 | Cream O Land Dairy | Florence, NJ | 158 | 87.8 | 309 | 378 |
| 602 | Mexim USA | Hayward, CA | 158 | 87.9 | 186 | 474 |
| 603 | Creamery Corp. | Anchorage, AK | 156 | 87.9 | 79 | 606 |
| 604 | Aksarben Foods | San Diego, CA | 154 | 87.9 | 322 | 370 |
| 605 | Famous Ramona | Ramona, CA | 153 | 87.9 | 199 | 463 |
| 606 | Ore Cal Corp. | Los Angeles, CA | 153 | 88.0 | 56 | 646 |
| 607 | Drake Bakery | Jacksonville, FL | 152 | 88.0 | 57 | 642 |
| 608 | Mauna Loa | Los Angeles, CA | 152 | 88.0 | 209 | 453 |
| 609 | Pearls Kitchen | Detroit, MI | 152 | 88.0 | 29 | 675 |
| 610 | Schulze Burch | Chicago, IL | 152 | 88.1 | 101 | 567 |
| 611 | Signature Foods | Omaha, NE | 152 | 88.1 | 524 | 286 |
| 612 | Williams Dist. | Sacramento, CA | 152 | 88.1 | 33 | 669 |
| 613 | Dairy Maid Food | Scottsdale, AZ | 151 | 88.1 | 62 | 626 |
| 614 | Daisy Brand | Dallas, TX | 151 | 88.2 | 82 | 597 |
| 615 | Gibsons Nursery | Tacoma, WA | 151 | 88.2 | 36 | 665 |
| 616 | Hi Grade Food | Miami, FL | 151 | 88.2 | 234 | 426 |
| 617 | Ready Pac Retail | Los Angeles, CA | 151 | 88.2 | 33 | 670 |
| 618 | Ross Swiss Dairy | Los Angeles, CA | 151 | 88.3 | 82 | 598 |
| 619 | Wampler Longacre | Philadelphia, PA | 151 | 88.3 | 997 | 196 |
| 620 | A H Hansen Sale | Honolulu, HI | 150 | 88.3 | 103 | 564 |
| 621 | Creamland Dairies | Albuquerque, NM | 150 | 88.3 | 59 | 634 |
| 622 | Old Colony Dist. | Ashland, VA | 150 | 88.4 | 98 | 572 |
| 623 | Villa Roma | Monterey Park, CA | 150 | 88.4 | 55 | 648 |
| 624 | Quick Dispense | Pomona, CA | 148 | 88.4 | 59 | 635 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|---------------------|-----------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 625 | Santa Rosa Egg | San Francisco, CA | 148 | 88.4 | 153 | 506 |
| 626 | Taylor Brothers | Mesa, AZ | 146 | 88.5 | 61 | 629 |
| 627 | Heller Dist. Co. | Sante Fe, NM | 145 | 88.5 | 101 | 568 |
| 628 | Tuscan Dairy Farms | Union, NJ | 145 | 88.5 | 101 | 569 |
| 629 | ZB Industries, Inc. | San Pedro, CA | 144 | 88.5 | 89 | 588 |
| 630 | Cargill Salt | San Francisco, CA | 143 | 88.5 | 39 | 659 |
| 631 | Fabila Foods | Sacramento, CA | 143 | 88.6 | 20 | 686 |
| 632 | Hi Pac Ltd. | Diamond Bar, CA | 143 | 88.6 | 323 | 368 |
| 633 | Inland Valley | Highland, CA | 143 | 88.6 | 61 | 630 |
| 634 | Lambert Greene | Fairfield, CA | 143 | 88.6 | 80 | 603 |
| 635 | Kehe Foods Dist. | Addison, IL | 142 | 88.7 | 120 | 539 |
| 636 | Smiths FD and D | Tolleson, AZ | 142 | 88.7 | 129 | 525 |
| 637 | Driftwood Dairy | El Monte, CA | 141 | 88.7 | 207 | 455 |
| 638 | Hawaiian Isles | Honolulu, HI | 141 | 88.7 | 185 | 475 |
| 639 | Sunmark, Inc. | St. Louis, MO | 141 | 88.7 | 88 | 590 |
| 640 | Sierra Spring Water | Sacramento, CA | 140 | 88.8 | 173 | 487 |
| 641 | Kotarides Baking | Norfolk, VA | 139 | 88.8 | 418 | 327 |
| 642 | Chicago Brother | San Diego, CA | 138 | 88.8 | 17 | 690 |
| 643 | International | Vernon, CA | 138 | 88.8 | 99 | 570 |
| 644 | Johnsonville | Sheboygan Falls, WI | 138 | 88.9 | 123 | 535 |
| 645 | Nobel Sysco Foods | Denver, CO | 137 | 88.9 | 247 | 415 |
| 646 | Cookes Plantation | Ponte Vedra Beach, FL | 136 | 88.9 | 179 | 480 |
| 647 | Murray Dist. | Indian Trail, NC | 136 | 88.9 | 124 | 532 |
| 648 | Sterling Downey | San Antonio, TX | 136 | 88.9 | 94 | 579 |
| 649 | Waynes Gardens | New Braunfels, TX | 136 | 89.0 | 26 | 681 |
| 650 | Apple and Eve, Inc. | Roslyn, NY | 135 | 89.0 | 33 | 671 |
| 651 | Rockford Colonial | Rockford, IL | 135 | 89.0 | 19 | 689 |
| 652 | Standard Beef Co. | New Haven, CT | 135 | 89.0 | 272 | 400 |
| 653 | Lindsay Intl. | Chicago, IL | 134 | 89.1 | 36 | 666 |
| 654 | Miller Meat Co. | Chino, CA | 134 | 89.1 | 63 | 624 |
| 655 | Port Clyde Food | Scarborough, ME | 134 | 89.1 | 15 | 694 |
| 656 | Schmitz Meats | San Leandro, CA | 133 | 89.1 | 124 | 533 |
| 657 | Ciba Vision Corp. | Atlanta, GA | 132 | 89.1 | 64 | 621 |
| 658 | Joan M. Johnson | Honolulu, HI | 132 | 89.2 | 67 | 619 |
| 659 | Norco Ranch | Norco, CA | 132 | 89.2 | 104 | 562 |
| 660 | Ranch Pak Eggs | San Leandro, CA | 132 | 89.2 | 195 | 466 |
| 661 | Boulder Valley | Boulder, CO | 131 | 89.2 | 105 | 561 |
| 662 | Sysco Food Service | Walnut, CA | 130 | 89.2 | 277 | 396 |

| Invoice rank | Trading partner | Headquarters | Number of invoices | Cumulative % of invoices | Dollar value | |
|--------------|---------------------|-----------------------|--------------------|--------------------------|-----------------|------|
| | | | | | Amount (\$000s) | Rank |
| 663 | Sewards Ice Cream | Mobile, AL | 129 | 89.3 | 34 | 667 |
| 664 | Codi Wholesale | Hawkinsville, GA | 127 | 89.3 | 1,514 | 141 |
| 665 | Country Lake | Minot, ND | 127 | 89.3 | 113 | 545 |
| 666 | Fuchs Baking Co. | Miami, FL | 127 | 89.3 | 28 | 677 |
| 667 | R & F Fancy Foods | Columbia, MD | 126 | 89.3 | 509 | 289 |
| 668 | United States | Portland, OR | 126 | 89.4 | 12 | 699 |
| 669 | Nutcracker Snacks | Billerica, MA | 125 | 89.4 | 82 | 599 |
| 670 | Seasia | Seattle, WA | 125 | 89.4 | 263 | 408 |
| 671 | Calistoga Miner | Phoenix, AZ | 124 | 89.4 | 38 | 660 |
| 672 | Oscar Mayer | Chicago, IL | 123 | 89.4 | 98 | 573 |
| 673 | Bridgeman Cream | Thief River Falls, MN | 122 | 89.5 | 114 | 544 |
| 674 | Loves Bakery | Honolulu, HI | 122 | 89.5 | 527 | 285 |
| 675 | New England Dairy | Hartford, CT | 122 | 89.5 | 131 | 521 |
| 676 | Pepsi Cola Bottlers | Utica, NY | 122 | 89.5 | 1,101 | 180 |
| 677 | R. M. Palmer Co. | Philadelphia, PA | 122 | 89.5 | 196 | 465 |
| 678 | Commercial | Honolulu, HI | 121 | 89.6 | 98 | 574 |
| 679 | Gibson Meat Co. | Duncan, OK | 121 | 89.6 | 586 | 268 |
| 680 | Smileys Gourmet | Corona, CA | 121 | 89.6 | 78 | 608 |
| 681 | Spectrum Group | St. Louis, MO | 121 | 89.6 | 27 | 679 |
| 682 | Stephany Foods | Pine Valley, CA | 121 | 89.6 | 34 | 668 |
| 683 | Maola Milk Ice | New Bern, NC | 120 | 89.7 | 534 | 282 |
| 684 | Derst Baking Co. | Savannah, GA | 119 | 89.7 | 232 | 430 |
| 685 | Elsies Bakery | Severn, MD | 119 | 89.7 | 79 | 607 |
| 686 | Roland Foods | Cheverly, MD | 119 | 89.7 | 50 | 650 |
| 687 | Seven Up Bottling | Oakland, CA | 119 | 89.7 | 542 | 281 |
| 688 | Conagra Turkey | Natchitoches, LA | 118 | 89.7 | 131 | 522 |
| 689 | Condaxis Coffee | Jacksonville, FL | 118 | 89.8 | 17 | 691 |
| 690 | McLane America | Salt Lake City, UT | 118 | 89.8 | 155 | 501 |
| 691 | Allergan Pharmacy | Pasadena, CA | 117 | 89.8 | 38 | 661 |
| 692 | Decker Food Co. | Dallas, TX | 117 | 89.8 | 161 | 497 |
| 693 | Golden Pac Food | Lancaster, CA | 116 | 89.8 | 155 | 502 |
| 694 | Pedersons Fryer | Tacoma, WA | 116 | 89.9 | 274 | 398 |
| 695 | Rich Seapack | Chicago, IL | 116 | 89.9 | 109 | 551 |
| 696 | Upstate Milk Co. | Rochester, NY | 116 | 89.9 | 14 | 696 |
| 697 | Nabisco Brands | Atlanta, GA | 115 | 89.9 | 344 | 354 |
| 698 | President Bakin | Atlanta, GA | 115 | 89.9 | 124 | 534 |
| 699 | Dairy Gold Food | Cheyenne, WY | 114 | 90.0 | 80 | 604 |
| 700 | Millers Honey Co. | Colton, CA | 114 | 90.0 | 20 | 687 |

APPENDIX C

EDI Direct Savings

This appendix describes our methodology for estimating the direct savings at the Defense Commissary Agency (DeCA) through the use of electronic data interchange (EDI). It draws extensively upon an approach that the Logistics Management Institute (LMI) developed and applied to the Department of Defense (DoD) business case¹ and to the Defense Finance and Accounting Service – Columbus Center (DFAS-CO) EDI program.² Our methodology involves three steps. First, we develop a workflow for each functional area and estimate a dollar value associated with every processing step in the functional area. We then estimate the total direct savings from implementing EDI within the functional area by multiplying the number of documents processed by the savings per document. Finally, we apply assumed implementation rates to each functional area to calculate life-cycle savings over a 10-year period.

DIRECT COST SAVINGS

Direct cost savings occur when EDI permits an activity to eliminate a variety of manual document processing steps, such as sorting, distribution, mailing, data input, error resolution, and storage. Table C-1 describes several of those steps in some detail. It also shows low, medium, and high estimates of the costs of carrying out those steps.

We calculated the costs using engineered work standards developed by the Defense Finance and Accounting Service – Indianapolis Center (DFAS-IN) to monitor employee performance. Those work standards represent the actual cost of performing manual processing activities at DFAS-IN on a per-document basis. Because EDI eliminates most of these processing steps, the costs shown in Table C-1 can also be used to calculate direct savings.

In estimating the savings from implementing EDI, we used existing DeCA processing times wherever possible. For example, we calculated the cost of data entry for a commercial invoice by using DeCA-supplied information [one invoice per minute multiplied by a General Schedule (GS)-4 level employee's fully loaded salary of \$21,000 per year divided by 120,000 work minutes per year equals \$0.175 per invoice]. We used DFAS-IN work standards in situations

¹LMI Report DL001-06R1, *A Business Case for Electronic Commerce*, Thomas P. Hardcastle and Thomas W. Heard, September 1990

²LMI Report DL001-02R1, *Defense Finance and Accounting Service – Columbus Center: An Electronic Commerce Program*, Thomas P. Hardcastle and William R. Ledder, May 1991.

where a DeCA standard did not exist. (For example the cost of storing a paper document that DeCA may need to retrieve at a later date is \$0.16.)

Table C-1.
Direct Savings Worksheet

| Operation | Activity | Comment | Cost (\$) | | |
|--------------------------------------|---|--|-----------|--------|------|
| | | | Low | Medium | High |
| [1] Document distribution | Separate documents, make copies, route to mailroom, prepare address labels, stuff envelopes | Costs increase with complexity of operation | 0.02 | 0.04 | 0.06 |
| [2] Mailing | Procure envelopes and stamps | Costs increase with number of documents requiring single envelopes | 0.11 | 0.16 | 0.26 |
| [3] Document receipt | Receive, open, sort, date-stamp, route | Costs increase with complexity of sorting | 0.01 | 0.02 | 0.03 |
| [4] Document processing | Match, reconcile, audit | Costs increase with document complexity and data volume | 0.15 | 0.26 | 0.41 |
| [5] Document preparation and control | Examine and prepare for data entry | Costs increase with document complexity | 0.13 | 0.21 | 0.47 |
| [6] Data entry | Enter data | Costs increase with amount of data | 0.06 | 0.17 | 0.68 |
| [7] Error resolution | Research and correct errors, prepare correspondence | Costs increase with volume of data | 0.05 | 0.07 | 0.09 |
| [8] Document storage and retrieval | Log, separate, sort, microfilm, box, file, retrieve documents | Costs increase with filing and microfilming requirements | 0.10 | 0.16 | 0.28 |
| [9] Telephone procurement | Procure material and services | Costs increase with number of telephone solicitations | 1.78 | 3.50 | 5.33 |

Table C-2 summarizes the direct cost savings, broken out by processing operation, for DeCA's key functional areas (invoicing and payment, item pricing/maintenance, receipt, and contracting). Because it is already highly automated, ordering is excluded from the table. (The \$0.69 savings associated with processing a payment was calculated in the DoD business case, so its processing flow is not shown.)³ Savings per document range from a high of \$6.42 for each contract processed through the use of EDI to a low of \$0.25 for each EDI item pricing transaction.

³LMI Report DL001-06R1, *A Business Case for Electronic Commerce*, Thomas P. Hardcastle and Thomas W. Heard, September 1990.

Table C-2.
Direct Cost Savings per Document

| Operation | Functional area | | | | | | |
|----------------------------------|-----------------|---------|--------------|------------------|---------|---------------|------------------------|
| | Invoice | Payment | Item pricing | Item maintenance | Receipt | New contracts | Contract modifications |
| Document distribution | 0.02 | 0.02 | — | — | — | 0.04 | 0.04 |
| Mailing | — | 0.26 | — | — | — | 0.16 | 0.16 |
| Document receipt | 0.02 | — | — | — | — | — | — |
| Document processing | 0.25 | 0.41 | — | — | — | — | 3.60 |
| Document preparation and control | 0.21 | — | — | — | — | 0.21 | 0.21 |
| Data entry | 0.17 | — | 0.09 | 0.18 | 0.17 | 5.40 | 1.80 |
| Error resolution | 2.36 | — | — | — | — | — | — |
| Document storage and retrieval | 0.16 | — | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| Telephone procurement | — | — | — | — | — | 0.45 | — |
| Total | 3.19 | 0.69 | 0.25 | 0.34 | 0.33 | 6.42 | 5.97 |

IMPLEMENTATION RATES

Although many EDI production systems can usually be fielded in a relatively short period of time — often within a year — realizing the full benefits of EDI takes time, especially if the number of trading partners involved is large or if an activity is implementing EDI concurrently in several functional areas. Based upon our experience with both government and private-sector EDI programs, we developed DeCA's EDI implementation rates (see Table C-3) using the following assumptions:

- ◆ DeCA will implement EDI in four phases:
 - Phase 1: invoicing and payment
 - Phase 2: item pricing and maintenance

- ▶ Phase 3: ordering and receiving
- ▶ Phase 4: contracting.
- ◆ Each phase (with the exception of invoicing and payment, which is already under way) will require a full year of development before DeCA is ready to implement a production system. During development we anticipate five manufacturers enrolling in the DeCA EDI program.
- ◆ During the production phase, manufacturers will be added to the DeCA EDI program at the following rates:
 - ▶ 25 manufacturers in year 1
 - ▶ 30 manufacturers in year 2
 - ▶ 60 manufacturers in year 3
 - ▶ 80 manufacturers in year 4
 - ▶ 100 manufacturers in year 5 and beyond.

Table C-3.
Implementation Rates

| Functional area | Implementation rate (percent)* | | | | | | | | | |
|--------------------------------|--------------------------------|------|------|------|------|------|------|------|------|------|
| | FY93 | FY94 | FY95 | FY96 | FY97 | FY98 | FY99 | FY00 | FY01 | FY02 |
| Invoice | 5 | 20 | 30 | 45 | 61 | 73 | 80 | 85 | 88 | 90 |
| Payment | 5 | 20 | 30 | 45 | 61 | 73 | 80 | 85 | 88 | 90 |
| Item pricing | 0 | 5 | 20 | 30 | 45 | 61 | 73 | 80 | 85 | 88 |
| Item maintenance | 0 | 5 | 20 | 30 | 45 | 61 | 73 | 80 | 85 | 88 |
| Receipt | 0 | 0 | 5 | 20 | 30 | 45 | 61 | 73 | 80 | 85 |
| New contracts | 0 | 0 | 0 | 5 | 20 | 30 | 45 | 61 | 73 | 80 |
| Contract modifications | 0 | 0 | 0 | 5 | 20 | 30 | 45 | 61 | 73 | 80 |
| Percentage of invoices | 5 | 20 | 30 | 45 | 61 | 73 | 80 | 85 | 88 | 90 |
| Number of trading partners | 5 | 30 | 60 | 120 | 200 | 300 | 400 | 500 | 600 | 700 |
| Percentage of trading partners | 0.1 | 1 | 2 | 4 | 6 | 9 | 12 | 15 | 18 | 20 |

Note: Chart shows relationship between invoice volume and number of trading partners. For example, 45 percent of invoice volume corresponds to 120 trading partners that represent 4 percent of DeCA's trading partners.

*Based on percent of invoices.

Under these assumptions, DeCA will achieve its target of 700 vendors and 90 percent of its total invoice volume in approximately 10 years. However, we believe that DeCA should aim to include all 2,090 manufacturers that currently submit at least one or more invoices per week in its EDI program.

Finally, we multiplied the direct cost savings per document by the implementation rates in Table C-3 to obtain the life-cycle EDI cost savings of \$61 million dollars shown in Table 5-1.

DETAILED WORKFLOWS AND SAVINGS WORKSHEETS

In Figures C-1 through C-6 and Tables C-4 through C-9, we provide the following information for each of DeCA's key functional areas:

- ◆ Detailed workflows, from the time DeCA receives a document until it is either archived or sent to another agency
- ◆ Savings worksheets that assign dollar values to each DeCA processing step.

Within each functional area, the workflow figure is accompanied by a savings worksheet. (The exception is Table C-8, which provides the savings associated with the flows in Figures C-4 and C-5.) The numbers in brackets in each figure correspond to a processing step in its accompanying table as categorized in Table C-1. At the bottom of each table, we show the key assumptions used to assign processing dollar values, such as the level and salary of the government employee that processes the document, or the number of minutes it takes an employee to process a document. To calculate government salaries, we added 30 percent for fringe benefits and overhead. Finally, all calculations use 1993 constant dollars.

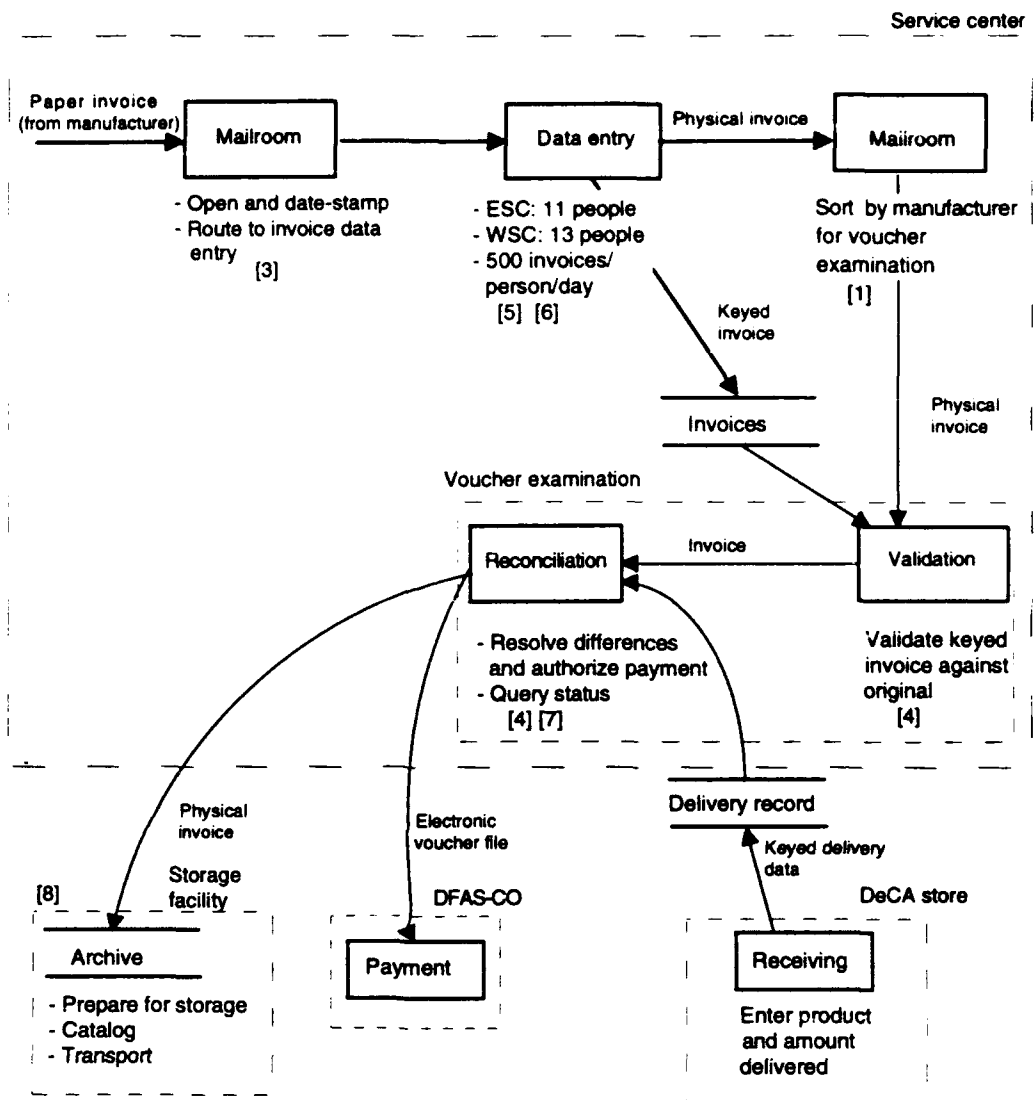


Figure C-1.
Invoice/Payment Flow

Table C-4.
Direct Savings Worksheet: Commercial Invoice

| Activity | Processing unit savings (\$) | | | | |
|--------------------------------------|------------------------------|--------------------|---------------------|-------------|-------------|
| | Mailroom | Automation support | Voucher examination | File room | Total |
| Document receipt [3] | 0.02 | — | — | — | 0.02 |
| Document preparation and control [5] | — | 0.21 | — | — | 0.21 |
| Data entry [6] ^a | — | 0.17 | — | — | 0.17 |
| Document distribution [1] | 0.02 | — | — | — | 0.02 |
| Document processing [4] ^b | — | — | 0.08 | — | 0.08 |
| Document processing [4] ^c | — | — | 0.17 | — | 0.17 |
| Error resolution [7] ^d | — | — | 2.36 | — | 2.36 |
| Document storage [8] | — | — | — | 0.16 | 0.16 |
| Total | 0.04 | 0.38 | 2.61 | 0.16 | 3.19 |

^aBased on GS-4 @ \$21,000/yr.; rate of 1 invoice/minute (supplied by DeCA).

^bBased on GS-4 @ \$21,000/yr.; rate of 2 invoices/minute (supplied by DeCA).

^cBased on GS-4 @ \$21,000/yr.; rate of 1 invoice/minute (supplied by DeCA).

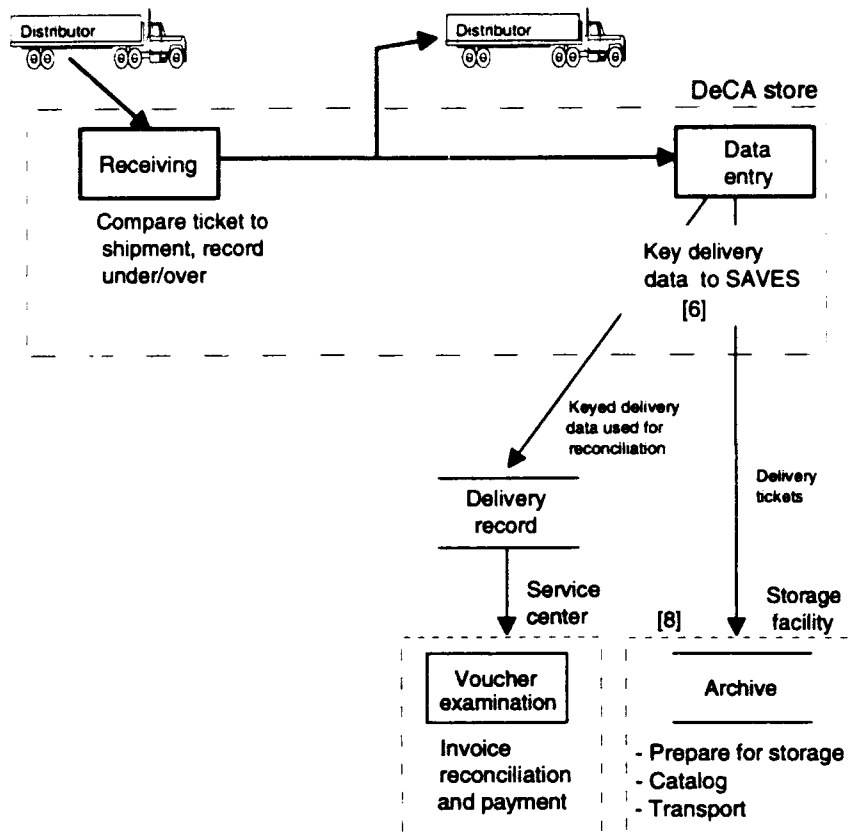
^dAssumptions: (1) GS-4 @ \$21,000/yr.

(2) Reconciliation requires 2 hours (\$21) (supplied by *Invoice Deduction Guidelines*. Food Marketing Institute, publishers).

(3) 15 percent of all invoices require reconciliation.

(4) 75 percent of invoice errors will be corrected by EDI (from Plans and Analysis Division study, "DeCA Invoice Key-In Rate," 28 January 1993).

(5) $\$21 \times 0.15 \times 0.75 = \2.36 .

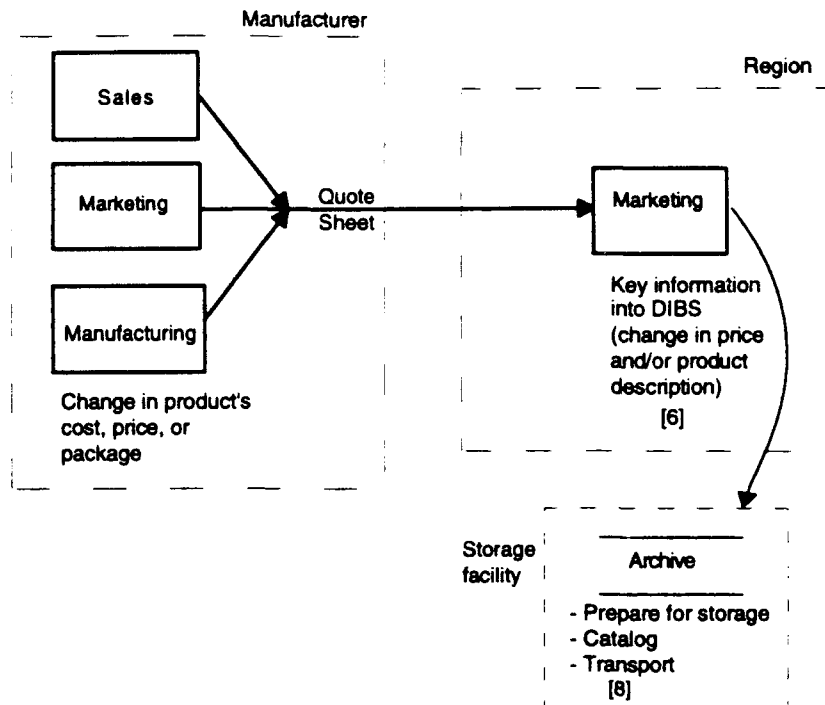


Note: SAVES = Standard Automated Voucher Examination System.

Figure C-2.
Receiving Flow

Table C-5.
Direct Savings Worksheet: Commercial Delivery Ticket

| Activity | Processing unit | | |
|----------------------|-----------------|-------------|-------------|
| | Control | File room | Total |
| Data entry [6] | 0.17 | — | 0.17 |
| Document storage [8] | — | 0.16 | 0.16 |
| Total | 0.17 | 0.16 | 0.33 |



Note: DIBS = DeCA Interim Business System.

Figure C-3.
Item Pricing/Maintenance Flow

Table C-6.
Direct Savings Worksheet: Item Maintenance

| Activity | Processing unit | | |
|----------------------|--------------------|-----------|-------|
| | Automation support | File room | Total |
| Data entry [6]* | 0.18 | — | 0.18 |
| Document storage [8] | — | 0.16 | 0.16 |
| Total | 0.18 | 0.16 | 0.34 |

*Costs based on GS-4 @ \$21,000/yr.; rate of 1 minute/item maintenance (supplied by DeCA).

Table C-7.
Direct Savings Worksheet: Item Pricing

| Activity | Processing unit | | |
|----------------------|--------------------|-----------|-------|
| | Automation support | File room | Total |
| Data entry [6]* | 0.09 | — | 0.09 |
| Document storage [8] | — | 0.16 | 0.16 |
| Total | 0.09 | 0.16 | 0.25 |

* Costs based on GS-4 @ \$21,000/yr.; rate of 0.5 minutes/item pricing (supplied by DeCA).

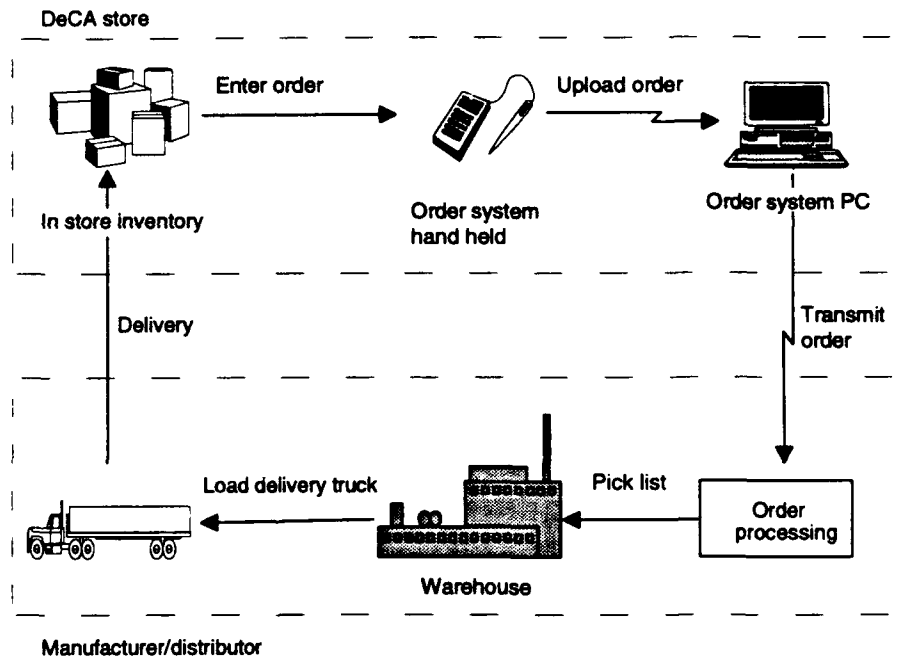


Figure C-4.
Ordering Flow

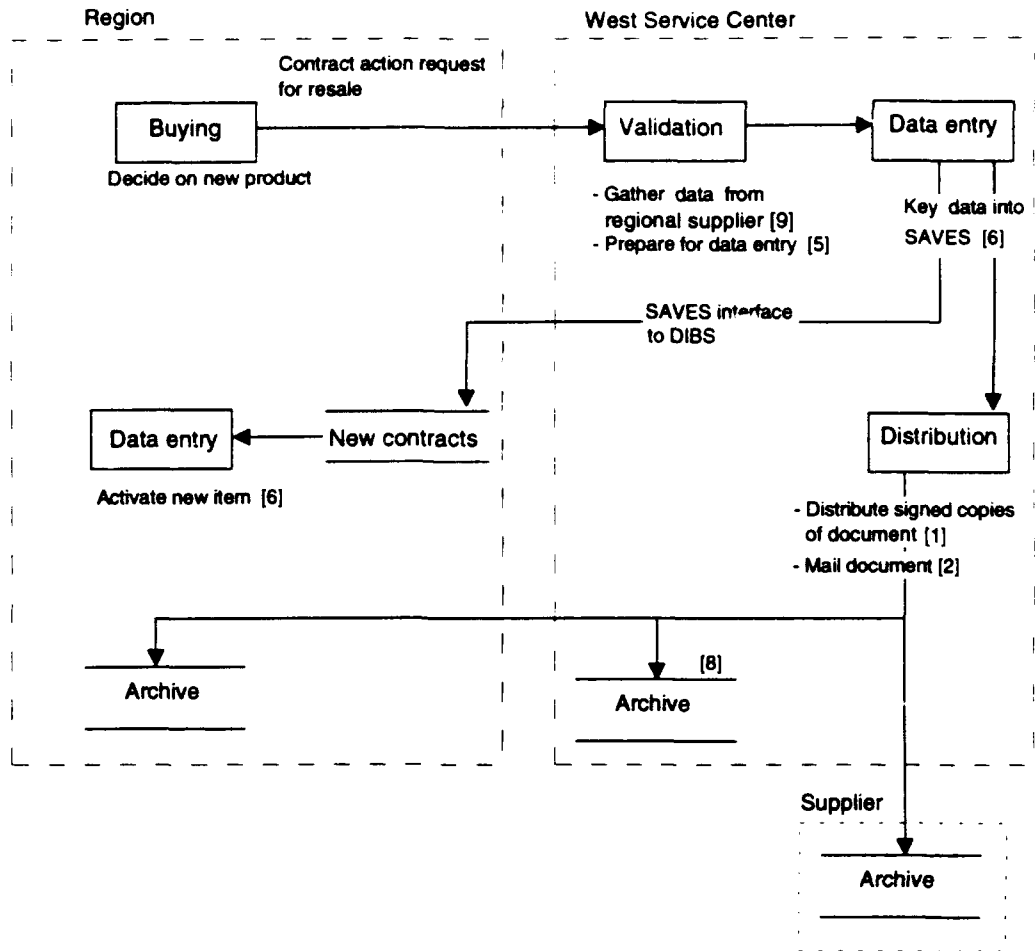


Figure C-5.
Contracting Flow

Table C-8.
Direct Savings Worksheet: Contracts

| Activity | Processing unit | | | |
|--------------------------------------|-----------------|--------------------|-----------|-------|
| | Mailroom | Automation support | File room | Total |
| Document receipt [9] ^a | — | 0.45 | — | 0.45 |
| Document preparation and control [5] | — | 0.21 | — | 0.21 |
| Data entry [6] ^b | — | 2.70 | — | 2.70 |
| Document distribution [1] | 0.04 | — | — | 0.04 |
| Mailing [2] | 0.16 | — | — | 0.16 |
| Data entry [6] ^c | — | 2.70 | — | 2.70 |
| Document storage [8] | — | — | 0.16 | 0.16 |
| Total | 0.20 | 6.06 | 0.16 | 6.42 |

^a Assumptions: (1) GS-4 @ \$12,000/yr.

(2) Average phone call requires 10 minutes @ \$0.18/minute (rate supplied by DeCA).

(3) 25 percent of all blanket delivery orders (BDOs) and blanket purchase agreements (BPAs) require phone clarification (rate supplied by DeCA).

(4) $10 \times \$0.18 \times 0.25 = \0.45 .

^b Based on GS-4 @ \$21,000/yr.; rate of 15 minutes/BDO or BPA (supplied by DeCA).

^c Based on GS-4 @ \$21,000/yr.; rate of 15 minutes/BDO or BPA (supplied by DeCA).

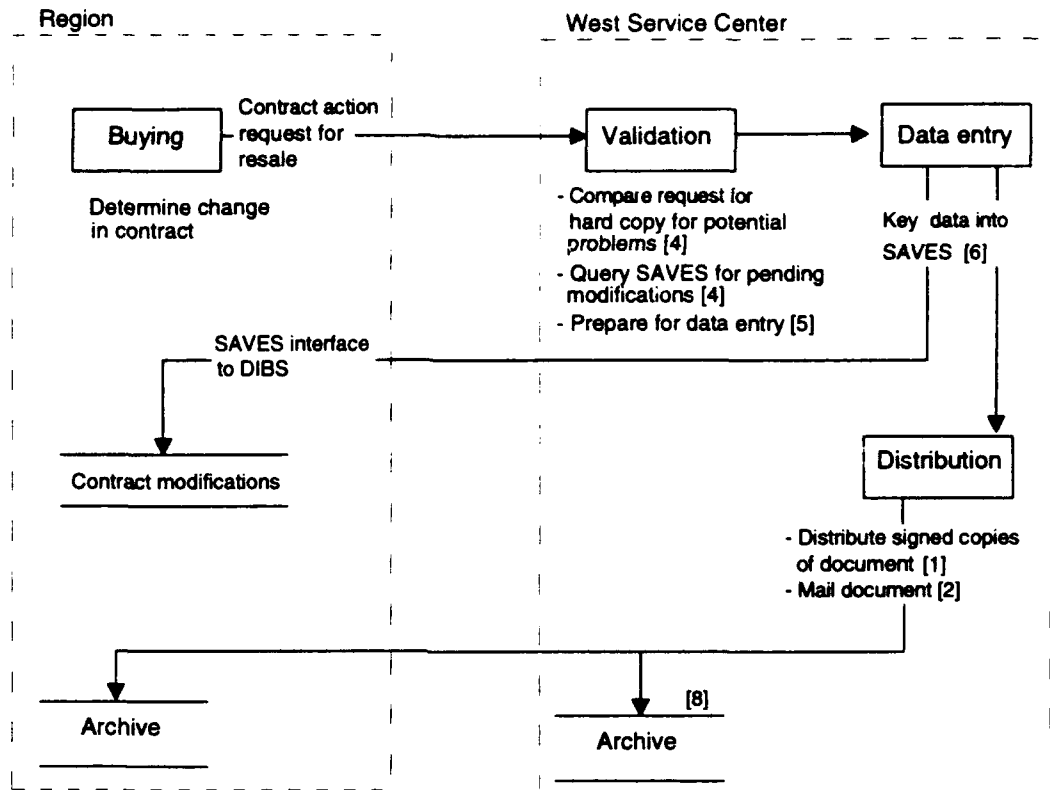


Figure C-6.
Contracting Modifications Flow

Table C-9.
Direct Savings Worksheet: Contract Modifications

| Activity | Processing unit | | | |
|--|-----------------|--------------------|-----------|-------|
| | Mailroom | Automation support | File room | Total |
| Document processing (comparison) [4] ^a | — | 1.80 | — | 1.80 |
| Document processing (SAVES query) [4] ^b | — | 1.80 | — | 1.80 |
| Document preparation and control [5] | — | 0.21 | — | 0.21 |
| Data entry [6] ^c | — | 1.80 | — | 1.80 |
| Document distribution [1] | 0.04 | — | — | 0.04 |
| Mailing [2] | 0.16 | — | — | 0.16 |
| Document storage [8] | — | — | 0.16 | 0.16 |
| Total | 0.20 | 5.61 | 0.16 | 5.97 |

^aBased on GS-4 @ \$21,000/yr.; rate of 10 minutes/comparison (supplied by DeCA).

^bBased on GS-4 @ \$21,000/yr.; rate of 10 minutes/query (supplied by DeCA).

^cBased on GS-4 @ \$21,000/yr.; rate of 10 minutes/document (supplied by DeCA).

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